

THE AUTOMOBILE AND MOTOR REVIEW

WEEKLY

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10 CENTS

TWO matters pertaining to street and road improvement that are of especial

To Connect City and Country.

interest and great importance to users of automobiles, especially in the metropol-

rails in Murray street, New York, for all sorts of vehicular traffic. The suggestion

the whole system of improved state highways of New Jersey, making pleasantly

this work by stating that such a road would form a connecting link between New York and



LAYING EXPERIMENTAL BLOCK OF FLAT STEEL RAILS IN MURRAY STREET, NEW YORK.

itan district and in the North Atlantic Coast States, are the proposal to construct a first-class macadam road across the Jersey or Hackensack Meadows from Jersey City to Newark, N. J., and the laying of one block of experimental steel

regarding the improved road across the Meadows was brought up at the first regular fall meeting of the Automobile Club of America last month by W. J. Stewart, secretary of the Automobile Club of New Jersey, who hinted at the importance of

accessible between 1,000 and 2,000 miles of some of the finest touring country in the United States.

TERRITORY MADE ACCESSIBLE.

New Jersey leads the country in the matter of road improvement, having con-

structed approximately 700 miles of hard roads since the passage of its State Aid law for road improvement in March, 1895. The largest portion of this work has been in the northeastern corner of the State nearest to New York City. A number of cross State roads have also been improved, however, as well as several running near and parallel to the coast. From Newark the best of roads lead directly to such important cities as Paterson, Rutherford, Morristown, the Oranges, Elizabeth, New Brunswick, Perth Amboy and South Amboy, Plainfield, Trenton, Freehold and Philadelphia, and to such well-known and popular winter and summer resorts as Lakewood, Cedarhurst, Asbury Park, Long Branch, Cape May and Atlantic City.

WILL OPEN FINE TOURING SECTION.

Some of the finest scenery in the country is in New Jersey, and except for the inconvenience and unpleasantness of making the run through Jersey City and across a rough and often very muddy road across the Hackensack Meadows, New York motorists would do much more riding and touring there. New Jersey is fully awake to the value of good roads as an inducement to wealthy New York business men to build not only summer homes west of the Hudson River, but to take up their permanent residence there, and, as many persons of this class have recently become owners of automobiles, the road commissioner and no doubt the Freeholders will be fully in sympathy with the movement to provide a good connecting link from this territory to New York City.

AFFECTS NEW YORK AND NEW ENGLAND.

On the other side, New York State, Connecticut and Massachusetts have all been very active during recent years in the building of improved roads under State Aid laws. New York State has constructed more than 150 miles of macadam roads since the passage of the Higbie-Armstrong act of 1898, and last winter the Legislature appropriated \$795,000 for the State's share toward road improvement, which, together with the share appropriated by the counties, made a total of \$1,590,000 to be expended during 1902 for State highways. About 200 miles were in process of construction in the middle of November, and plans had been approved for 310 miles more to be improved. At the last session of the Legislature a bill was introduced providing for the issuance of State bonds for the purpose of raising \$20,000,000 with which to push the work ahead much more rapidly, and, although this was not passed, the good roads committee of the Automobile Club of America is very much interested in it, and undoubtedly the support of the organization will be given to the bill when it comes before the Legislature again this winter.

The Catskills district and all of the Hudson River Valley in New York are pop-

ular touring sections, while the Berkshire Hills in Western Massachusetts and the Connecticut and Hoosac River valleys in Connecticut are also noted for their scenic beauties and good roads. Most of the automobile touring so far done in the United States has been over the State roads of Massachusetts, Connecticut and New York. With the improvement of the road across the Hackensack Meadows all of this territory will be directly connected with the touring section of New Jersey, thereby consolidating the best automobile touring States in the country into one great system. In the words of Mr. Stewart, almost 2,000 miles of good roads will be made accessible to New York City upon the completion of such a road, as it will open the way to good highways that extend up into Southern New York State, as well as across the length and breadth of New Jersey nearly to Camden, Delaware Water Gap and Deman's Ferry. Moreover, by way of the Brooklyn Bridge, such a road will form a connecting link from the Jersey roads to the excellent road system of Long Island, where motor-ing has long been most popular.

LOCATION OF PROPOSED ROAD.

Reference to the accompanying map will show the relative geographical locations of New York City, Jersey City, Newark and Brooklyn and the intervening Hackensack Meadows. These meadows might more properly be designated swamps, for they are under water a large part of the year and are productive of nothing but rank rushes and odors that emanate from abattoirs and fertilizer factories and of the celebrated Jersey mosquitoes. Until they have been fully drained by a very expensive system land there will not be much sought for any purpose. There are now two wagon roads across the Meadows from Jersey City to Newark, one the Old Plank road and the other the Turnpike. The former is in a disreputable state, the planks having worn out, leaving chuck holes that make riding unpleasant in dry weather and most disagreeable in wet weather. The improvement and maintenance of this road has been neglected, because, by its location, almost its full length, including the bridge over the Hackensack River and half of the bridge over the Passaic River is in Hudson County, upon which thus falls by far the greater burden of the expense. So acute became the feeling between the two counties over the matter of paying for the maintenance of the bridges that for five months last year the road was closed, as there was no appropriation to pay for bridge tenders to swing the bridges for passing boats.

PRESENT CONDITION OF TURNPIKE.

The Turnpike is in much better condition, much broken stone having been laid on it even during the past summer. It is raised four or five feet above the level of the swamp and does not overflow, but the broken stone was never properly com-

pacted by rolling, and the road is not sufficiently crowned in places, so that the riding is rough in dry weather and muddy after rain. Efforts to secure the construction of a good macadam road have heretofore been frustrated because, it is understood, the street railroad company which operates a line of electric cars on the Turnpike declined to bear any of the burden of improvement or of construction of new bridges, claiming to have a private right of way. It has recently changed its attitude, however, and is now understood to be willing to contribute its share toward improvement. Its rails are laid on either side of the roadway, about a rod separating them. To make a first-class highway of this road it should be raised several feet more, broadened and well surfaced with broken stone, rolled hard. It is thought that the Newark factories will gladly contribute cinders for filling. The bridges should also be widened, as traffic becomes much congested on them, especially on that over the Passaic River, when trolley cars and wagons are crossing at the same time. The worst parts of the road now are at Harrison, at the west end of the Turnpike, and between the Lackawanna Railroad and the Hackensack River bridge at the eastern end. These places are shown in the photographs. The length of road that needs improvement most imperatively is about three and a quarter miles, the streets in Marion, at the east end, and in Harrison, at the west end, being paved with granite blocks in fair condition.

AUTOMOBILE CLUB COMMITTEE MEETS.

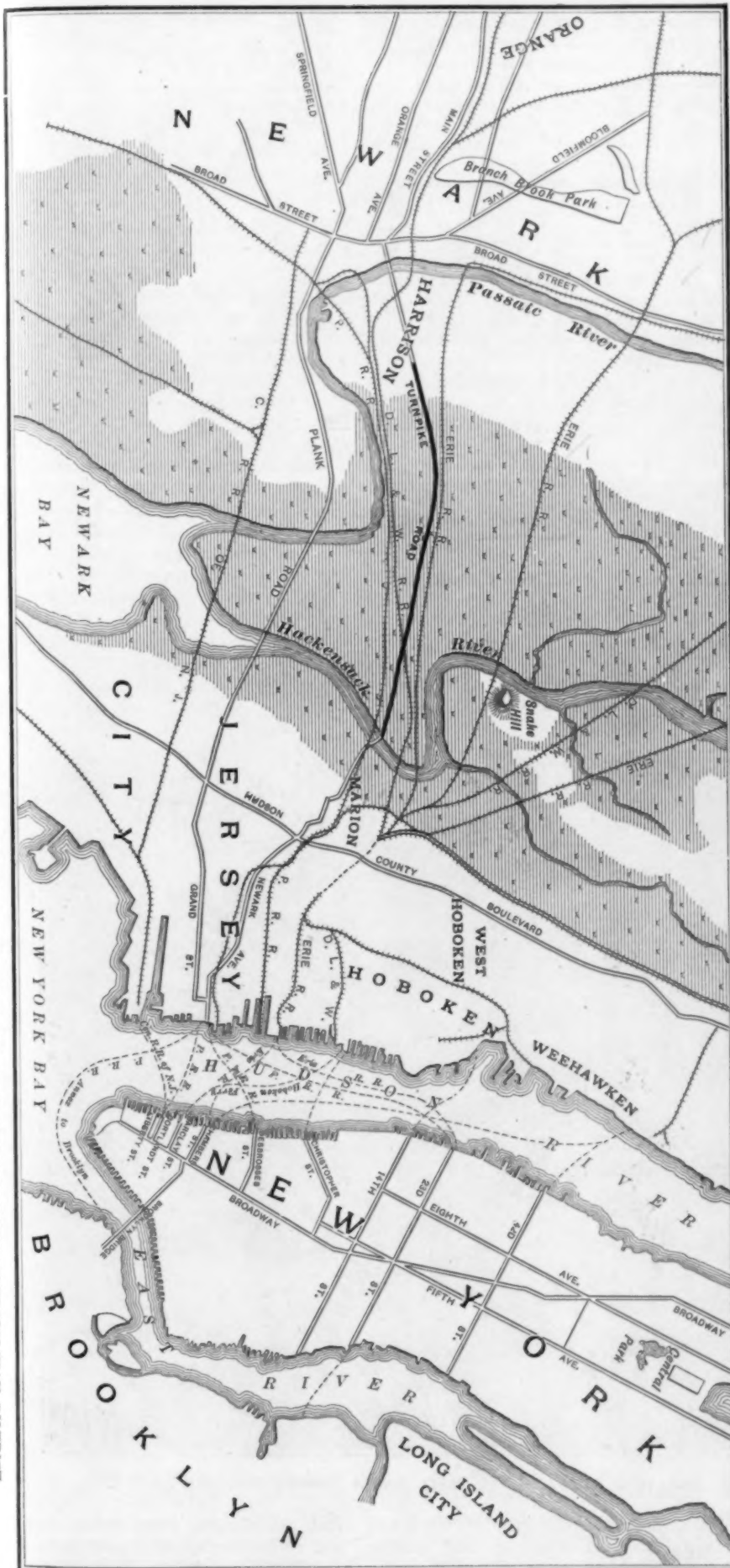
At the meeting of the Automobile Club of America, at which this subject was brought up, it was proposed that the A. C. A. and the Automobile Club of New Jersey should co-operate to secure the construction of a good road across the Meadows, and, if necessary, to raise subscriptions to further the work. A committee has since been appointed consisting of Jefferson Seligman, of the good roads committee of the A. C. A.; W. T. Stewart, secretary of the Automobile Club of New Jersey, and General Roy Stone, to take up the matter with the proper authorities in New Jersey. On November 14 General Stone addressed a letter on the subject to Henry I. Budd, State Commissioner of Highways for New Jersey, as follows:

November 14, 1902.

Hon. Henry I. Budd, State Commissioner of Highways, Trenton, N. J.

Dear Mr. Budd:—We are beginning to lay a little specimen of steel road in the city, as you may have seen, and the Automobile Club of America and the Automobile Club of New Jersey are taking in consideration the question of connecting the streets of New Jersey with those of Newark, either by a new road across the Hackensack Meadows or an improvement of the old Turnpike. If the steel roads are satisfactory here, they would desire to have a double steel track laid across the meadows, the object being to reach the goods roads of New Jersey.

MAP OF HACKENSACK MEADOWS AND SURROUNDING TERRITORY, SHOWING HOW IMPROVED ROAD WILL CONNECT NEWARK WITH METROPOLITAN DISTRICT.



I am not able to say whether the laws of New Jersey would permit the laying of the steel rails under State aid or whether some legislation will be necessary for that purpose. I think the clubs would make a substantial contribution if this work could be undertaken promptly, and I write to ask further necessary information in order that I may follow it up without delay. Please let me hear from you at as early a date as possible.

Please give me the mileage of improved roads in New Jersey as nearly as practicable, also some estimate of the mileage on the Pennsylvania side, which would all be made accessible to motor travel from this city by a reconstructed link across the meadows.

Faithfully yours, ROY STONE.

HOW EXPENSE WOULD BE DISTRIBUTED.

"Commissioner Budd replied to this in part as follows:

Trenton, N. J.

General Roy Stone:

I think that the laying of steel rails would be permitted by the State Aid Law of New Jersey provided it took the usual course, that is, the property holders along the line of the road made application for its improvement by means of steel rails, or for the freeholders of the counties in which the road is, to declare it a county road and order its improvement. In either case if it receive the approval of the State Road Commissioner it would carry State Aid. Of course the cost might have something to do with deterring action in the matter, but if the clubs would be willing to make substantial contribution this would place it on the level of cost with the gravel or stone or shell roads.

In reply to your second question, would say the mileage of improved roads in New Jersey ranges from twelve to fifteen hundred. I think there are very few improved roads on the other side of the river (Delaware)—none that would reach from Philadelphia to Trenton.

H. I. BUDD,
State Commissioner of Public Roads.

The present State Aid law of New Jersey provides that when the Board of Freeholders of any county decides to improve a certain road and the application and specification submitted by them to the State Commissioner of Highways have been approved, the State shall bear one third of the cost of the work, the abutting property owners one-tenth and the county the balance. There is only one property holder along the line of the road to be improved, the Hackensack Meadows Improvement Company, and, while its 10 per cent. of the cost would amount to a considerable sum, the company is said to be in favor of the improvement, as it will enhance the value of its property.

STEEL RAILS ACROSS THE MEADOWS?

There is no unanimity as yet among those directly interested in securing a good road across the Meadows regarding the suggestion that steel rails be laid there for wagons and automobiles. General Stone, who for years has advocated the use of flat steel rails for the purpose of lightening traction on highways, hopes that the automobile clubs will be sufficiently interested in the matter to provide for the additional expense by direct con-

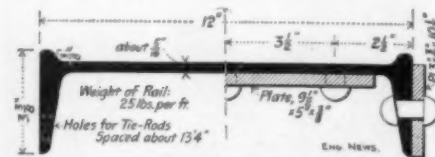
tributions and subscriptions. No other expense in connection with the improvement of the Meadows road would have to be borne by the clubs. President Shattuck, of the A. C. A., on the other hand, thinks that it would be hardly feasible for the clubs to undertake to provide for the laying of three miles or more of rails at an estimated expense of about \$4,000 per mile. Secretary Stewart, of the A. C. of New Jersey, suggests that a portion of the mile of such rails presented through the Automobile Club of America by the United States Steel Corporation for experimental purposes in New York be laid in the Turnpike, where the character of traffic is much like that on any much-used road leading into a large city. General Stone, when interviewed on the subject last Friday, stated that he thought all of this mile would be laid in New York on Manhattan Island.

EXPERIMENTAL RAILS IN NEW YORK.

The work of laying the experimental block of steel rails in Murray street, New York, has been in progress for several weeks and is now almost finished. It remains to resurface the sides of the street with asphalt on one side and with bituminous macadam as an experiment with this new paving material on the other. The experiment is of especial interest to mo-

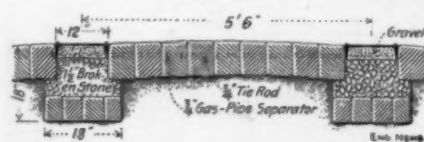
beginning of a new method of street and country road improvement which will make motoring much more pleasant.

Permission of the authorities of Manhattan Borough has been obtained for the



SECTION OF RAIL - MIDDLE AND END
[Showing Method of Jointing Rails with Fishplates.]

laying of other stretches of these rails, and it is expected that as fast as possible such stretches will be laid in New Elm street, Seventh avenue at about 120th street, in some street on the west side



SECTION OF STEEL ROAD OR STREET.

of and parallel to Broadway downtown, and perhaps between Kings Bridge over the Harlem and the bridge across the canal. New Elm street is one block east of Broadway and extends parallel thereto.

tunnel. The time has come for its repavement, and, as it is a broad thoroughfare, extending up and down the island through the heart of the business district, it is believed that the laying of the rails there will tend to draw a large proportion of the traffic off of Broadway and relieve the congestion in the main artery of the city.

AID FROM THE AUTOMOBILE CLUB.

It is through the assistance of the Automobile Club of America that the ideas of General Stone are being put into effect. Following an address by General Stone on steel highways at one of its meetings, the club decided to take up the matter and appointed a special committee on the subjects, which designated Jefferson Seligman and General Stone as a sub-committee to procure the special steel rails for the trial pieces of road and to confer with the city authorities regarding suitable locations. Accompanied by President A. R. Shattuck, chairman of the A. C. A. good roads committee, they called on President Cantor, of the Borough of Manhattan, and, upon explaining their mission, found him cordially disposed toward the enterprise and quite willing to give the necessary permission. He proposed a conference between General Stone and Chief Engineer Olney with reference to locations. These having been chosen, President Shat-



RAILS IN POSITION READY FOR REPAVING STREET—RAIL END SHOWS CONNECTING FISH PLATES.

torists, because should the rails and the method of laying them prove as successful in use as is hoped, this may mark the

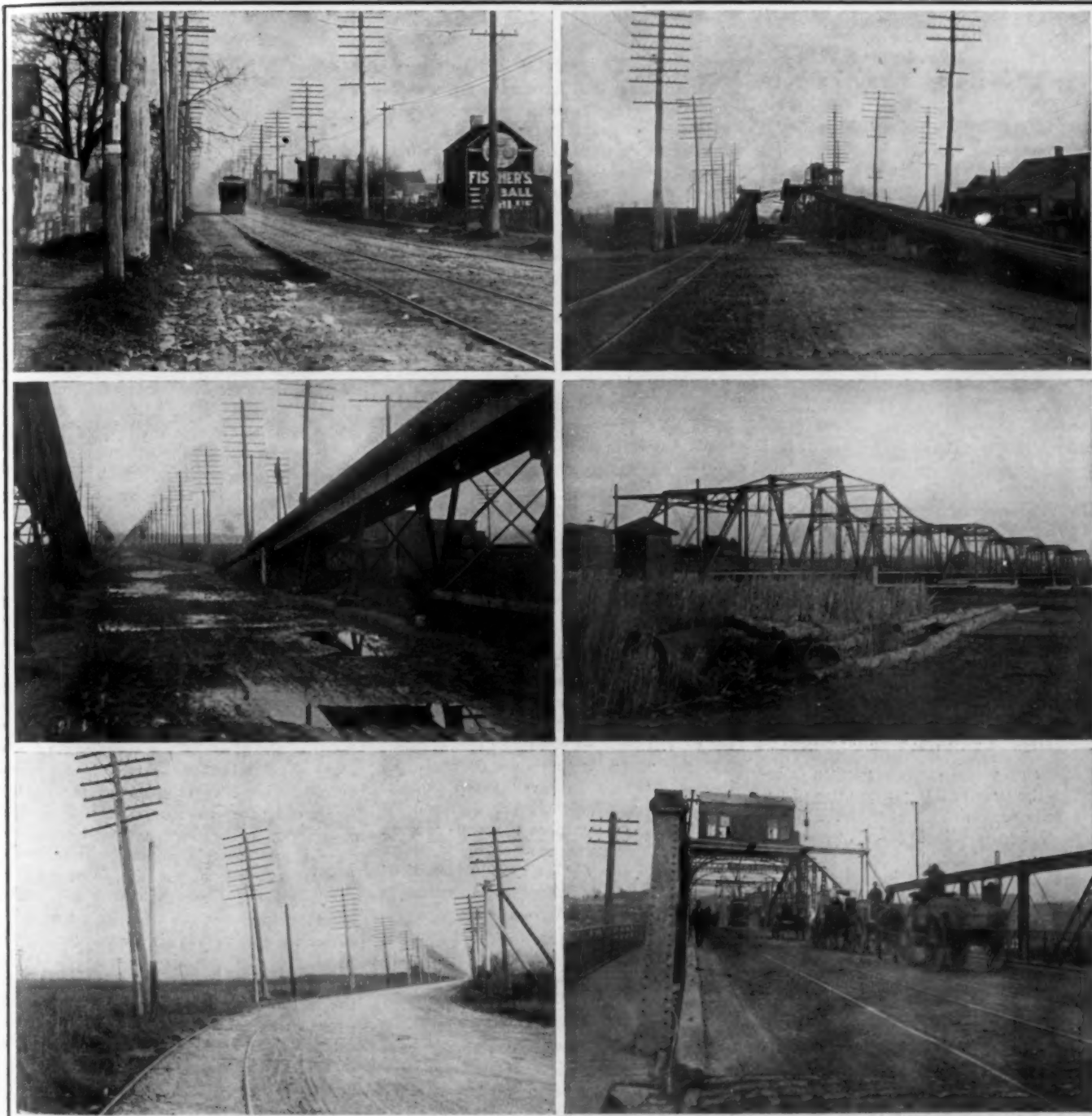
It has for years been torn up for sewer construction, for widening, and latterly for the construction of the rapid transit

tuck and General Stone called upon several of the smaller steel manufacturers to see if they could and would roll the spe-

cial form of rails required, but without success. Finally they went to President Schwab, of the United States Steel Cor-

him to get a resolution of the Board of Aldermen sanctioning his issuance of such a permit. This caused a long delay, but

their dimensions, the manner of joining the ends by fish plates riveted underneath and to the sides of the meeting ends of



VIEWS OF TURNPIKE ROAD ACROSS HACKENSACK MEADOWS.

Old Wornout Pavement in Harrison.

Bad Stretch of Road in Wet Weather.

Looking Toward New York—Snake Hill to Left.

Street Car Viaduct Over Lackawanna Railroad.

Long Bridge Over Hackensack River.

Narrow Swing Bridge Over Passaic River.

poration, who not only agreed to have the special rolls made, but offered to furnish the club one mile of double rails gratis for experimental use. The material began to arrive in New York early in September, when, upon applying for a permit to lay the rails, General Stone found that the Corporation Counsel had advised President Cantor that it would necessary for

finally the tail end of the red tape was found so far as Murray street was concerned, and the actual work began the middle of November.

FORM OF THE RAILS.

The two large photographs show the work in progress and the method of laying the rails, while the sectional line drawings show clearly the form of the rails,

two rails, and the way in which the parallel rails are held the proper distance apart by rods and pipes placed at intervals of approximately thirteen feet and imbedded in the granite block paving between the rails. The trough of the rails is flat and perfectly smooth, while the slight bead or rib at each edge offers only enough resistance to the wheels of wagons

to keep them in the rails when going straight ahead without rendering it difficult to turn into or out of them at any point. The rails are each forty feet long and weigh twenty-five pounds to the foot. The stretch of track in Murray street when completed will be 375 feet long. There is a slight grade of about 1 1-2 per cent. in the street.

HOW THEY ARE LAID.

In laying the rails a trench about eighteen inches square is dug under the center line for each rail and a layer of granite blocks is placed on the bottom of this trench. The trench is then filled with broken stone of one and one-half inch size, and on top of this is placed fine gravel to fill the interstices and form a solid bed for the rail, which is then laid in place and riveted to the next one. The stone and gravel is then tamped solidly around it.

Should it be decided to lay rails in the improved road across the Hackensack Meadows a somewhat different procedure may be necessary, thinks General Stone, owing to the unstable nature of the subsoil. The roadway practically floats on a bed of muck and peat and is liable to sink in places, which would cause the rails in time to become uneven. Therefore he suggests that two planks, 12 x 3 inches, be embedded flatwise and edge to edge in the crushed stone with which the trenches are filled, so that the edges of each rail will rest just above the middle of the two planks, giving a broad and unyielding bearing for the rails.

SLIPPING THE ONLY PROBLEM.

The main question that has arisen in regard to the practicability of the use of flat steel rails for wagon traffic is the likelihood of horses slipping on them when they are wet and muddy. Answering this, General Stone says that it is well known that horses do not fall down unless both front feet or both hind feet slip at the same time, and the horses will naturally step on the paving stones between the rails or outside of them as much as possible. Asked what effect he thought the collection of snow or the freezing of water in the rails in level places would have, General Stone answered that the film of ice would be so thin that the feet of horses and the wheels of wagons would break it up at once so that it would cause no trouble. He has, however, designed rails to obviate slipping of horses and automobile wheels on grades and when the rails are muddy. One form of these has rectangular depressions approximately three by two inches in size and quarter of an inch deep rolled in the top surface of the rail. These are just large enough for the caulk on horses' shoes to catch in and also deep enough to give a "purchase" for the rubber tires of motor vehicles, but not so deep as to cause any jolting or pounding in a vehicle fitted with iron-tired wheels. These rails also have outwardly extending

lips at frequent intervals along their upper and outer edges to catch the tires of wheels and assist in lifting them into the rails when the rails happen to be somewhat higher than the street surface alongside.

ADVANTAGES OF THE RAILS.

Careful tests that have been made show that on a level the force required to haul a load on steel rails is less than one-fourth that required to haul the same load on an average stone road, and is much less than that necessary to draw an equal load on level asphalt, according to General Stone. Mr. F. Melber, a Pittsburgh engineer, reporting on experiments he had made on a steel roadway, stated that in twenty trials made with an iron wagon weighing 1,550 pounds the average force needed to pull a ton was 3.23 pounds, while previous experiments made at Atlanta showed that the average tractive force required per ton on good macadam was 41 pounds and on hard earth roads was from 75 to 102 pounds.

Durability and a great saving in the cost of maintenance are other important advantages claimed for the steel roadway. Horace Lee Washington, United States Consul at Valencia, Spain, reporting upon the two-mile steel road between Valencia and Grao, in 1899, wrote that up to 1892 the road had been constructed of flint stone which had cost \$5,470 annually to keep in repair. After the rails were laid it was found that the cost of keeping in repair the central zone of road thus relieved of heavy traffic—which went over the rails instead—amounted to only about \$380 per year. At that time the rails had been in position for seven years, and the municipality of Valencia was of the opinion that the saving in cost of repairs soon pays for the extra cost of construction of the steel road. The rails had required no repairing during those seven years, and showed a wear of only one-tenth of a millimeter per year. There is ample room between the rails for horses to walk abreast, and the Consul reported that horses did not appear to slip on the rails.

A BOON TO MOTORISTS.

The advantage that such steel highways would offer to motorists are apparent, provided the experiments so soon to be made in New York shall demonstrate satisfactorily that when their surfaces have become polished from wear and are covered with mud or slush they will still offer sufficient adhesion to rubber tires to provide the required traction necessary to propel the vehicle. It is pleasant to imagine driving in a swiftly moving automobile over the ideal road as pictured by General Stone—a highway having a well-graded and slightly crowned earth bed rolled hard, with two lines of broad, smooth steel rails extending down its middle, and grass growing between them and on both sides and kept mowed short. The troubled dust problem would be solved

without recourse to the pouring on of oil; the glaring white stretch of highway wavering ahead under a blazing summer sun would no longer hurt the eyes, while the machine would, to repeat a trite phrase, "ride like a Pullman sleeper."

The probability that horses will continue to be used for several more years as tractors renders the complete realization of such a road somewhat visionary, unless the promoters of the several private automobile speedways projected on Long Island can be induced to change their plans and secure a private right of way in the Jersey Meadows for such a race course and lay such rails there.

FIRST PEUGEOT COUPE IMPORTED INTO THE UNITED STATES.

The luxurious motor cab or coupe shown herewith was recently imported from Paris. It is a product of the Peugeot Freres, of Paris, and is the first of its kind brought to New York City. Aside from the novelty of its general lines, which are apparent in the picture, it is noteworthy in a number of other respects. It is driven by a double-cylinder gasoline motor suspended on the spring supported frame, which is made of heavy two-inch tubes, bent to the desired angles and curves. The motor is only slightly inclined from the horizontal and is located under the rear of the body. It is equipped for either electric spark or hot tube ignition, the latter being used by preference. The ignition tubes extend directly out to the rear from the heads of the motor into a metal box enclosing a gasoline burner. Fuel under air pressure is forced to this burner through a fine metal tube extending alongside of the main frame tube from a three-quart polished brass cylindrical reservoir extending transversely across the front of the carriage beneath the dashboard. A small hand pump under the operator's seat furnishes the compressed air for this tank. The portion of the carriage body at the rear, covering the motor head and burner for the ignition tubes, is of metal with hinged doors in the rear end and on top to give access to the interior. Large perforations in these doors provide ventilation for the burner.

Water for the circulation system is carried in a ten-gallon tank of flat rectangular form suspended beneath the floor of the vehicle at the middle, and the radiator is forward of the front axle, as shown. Circulation is by pump driven from the motor. Gasoline for the motor is carried in an eight-gallon copper tank beneath the driver's seat, whence it flows to the carbureter, which is located in the extreme right lower corner of the rear end of the body, at some distance from and below the inlet valves. The muffler is hung transversely beneath the head of the motor and just behind the rear axle, and the exhaust from the two cylinders enter it at opposite ends.

Transmission is through a four-speed gear system, carried in a metal box under the enclosed portion of the body, to a counter shaft, from either end of which a chain runs over a large sprocket bolted to the hub of a rear wheel. The speed range is from four to twenty-five miles an hour. The gear system is accessible from the interior of the body by lifting footboards. Double-acting band brakes are fitted, one to each drive wheel, just inside of the sprockets, and are set by a powerful hand lever shown at the side of the driver's seat. There are seven grease cups in a bank under the rear seat for lubricating the journals of the power plant, while the cylinders and lighter running parts are lubricated from a gang oiler located in the rear of the cab body. A foot-operated brake on the right hand end of the speed gear

end of the dash. Near the top of the steering post are small levers and sectors for regulating the mixture for the motor. The sleigh-like dash is hollow for the storage of various articles likely to be required by the mechanic. For convenience in filling the water tank, there is a small box enclosing the funnel end of a tube just beneath the lamp on the right side.

The tubular frame of the vehicle is made double in the middle section, where it is also braced transversely by tubes that support the brackets for the gear system and the lower end of the motor.

The half door at the front of the cab portion swings forward easily on a hinge at the bottom, while the glass front folds up against the inside top of the cab. The vehicle is highly finished and most luxuriously upholstered. It is very comforta-

rean as any that outdoor life affords, is a difficult foundation on which to construct an effective story. The subtleties of its mechanism, so absorbing to the initiated, contain for the lay mind rather less significance than a palimpsest manuscript. It is difficult to be heroic in an automobile—the quality which furnishes the essence of most railroad stories, for example—for the automobile is too essentially selfish. Nevertheless, the automobile has a quality of its own, born partly of the joy of speed and partly of the mechanic's delight in conquering difficulties; and assuredly there is no writer living better qualified than the author of "007" to interpret it for us. "Steam Tactics," though comedy, is good comedy; and automobile literature holds nothing better than the author's stirring picture of the



IMPORTED PEUGEOT 10 HORSE-POWER CAB WITH HOT TUBE AND ELECTRIC IGNITION.

shaft serves for ordinary braking. The speed change clutch is mounted on the opposite end of this shaft, and is operated through a system of simple levers and rods from the driver's seat.

Steering is by means of a vertical post enclosing a shaft rotated by a transverse bar at either end of which is mounted a perpendicular handle or grip. The lower end of the steering shaft carries two small sprockets, around which run two chains of the same size, to eighteen-tooth sprockets journaled in a bracket brazed to the left frame tube and carrying at its lower end a steering arm connection similar to a steering knuckle. The starting, stopping and reversing lever is just back of the right

ble and easy when in motion, and is almost noiseless in operation. The total length of the vehicle over all is 10 1-2 feet; the length between axles nearly 7 feet, and the width 5 3-10 feet. The total weight is approximately 2,200 pounds. The Central Automobile Co., 1684 Broadway, New York, is the importer and American agent.

Kipling's Motor Story.

A most entertaining story by Rudyard Kipling, entitled "Steam Tactics," in the *Saturday Evening Post* of December 6, will be welcomed by the Kiplingites who have been looking for a "motor" story from that gifted author's pen. The automobile, while as delectable an instrument of rec-

flight of the Octopod over leagues of countryside through all the summer afternoon, to maroon a meddling police officer, who had forgotten his badge, in the remotest corner of Sussex.

Aroused Against Toll Roads.

Syracuse motorists are so displeased by the condition of many of the toll roads in their county that they intend to take steps during the winter to compel the holders of the franchises to live up to their obligations. Two plans are being considered—the paralleling of the roads by State highways, and the bringing of actions against the holders of franchises.

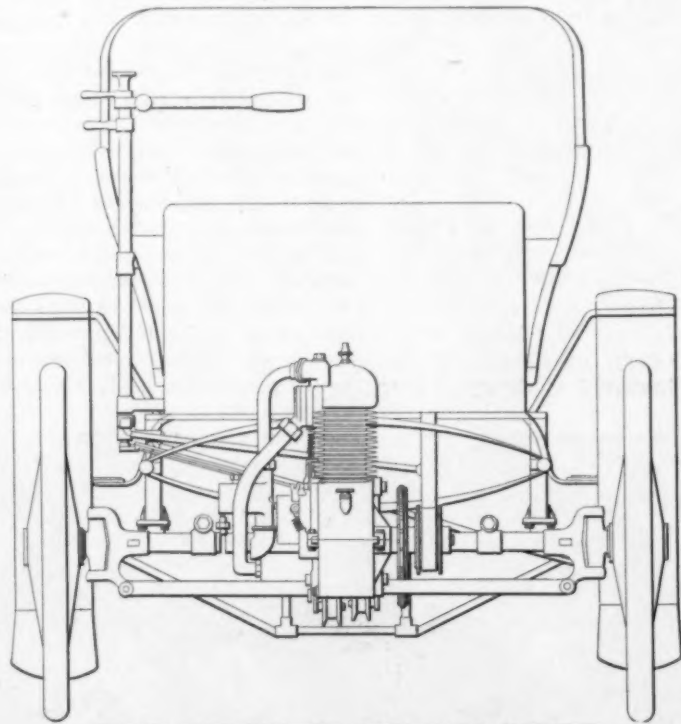
THE AUTOMOBILE CARRIAGE IN ITS SIMPLEST FORM.

Between the motor bicycle and the one hundred horse power racing machine the automobile principle is embodied in an almost infinite variety of construction types leading by insensible degrees from the simplest to the most elaborate. If there are good scientific reasons for using 2,000 pounds of material in a machine intended for transportation of two persons, it yet remains undisputed that a somewhat similar service can be rendered by a machine weighing less than 500 pounds, or even than 200 pounds in the case of a motor tandem. The two principal factors which call for the large machine are speed and elegance. Where these are reduced to second or third consideration, size, power, weight and elaborateness in construction may also be reduced, but to what extent remains as yet largely a question of judgment, of taste and of individual preference. There is apparently a public for all the varieties, at least in this country where the automobile movement is more democratic than anywhere else.

Among the machines in which simplicity has been carried close to the standard of the motor cycle the Crestmobile occupies a peculiar position by reason of the bluff frankness of its design. There is in it absolutely no evidence of a desire to flirt with the fashions of the day. A quadricycle with buggy comforts; a gasoline motor vehicle which can be started

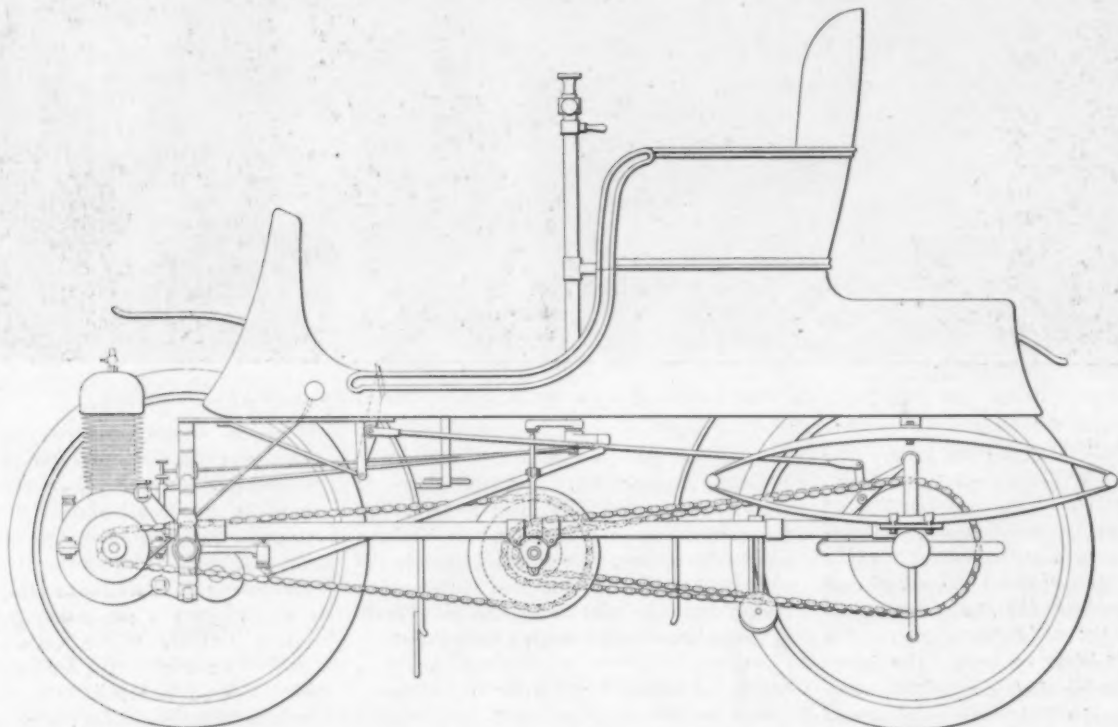
though it drives the rear wheels—and this motor of the simplest possible pattern, single cylinder and air-cooled; a driving mechanism by chains which seems quite

Whether the high ideals of the scientific engineer are embodied in the design does not matter greatly if the car will work and "stand up." If its riding qualities



FRONT VIEW SHOWING MOTOR ARRANGEMENT.

familiar to one who has ridden a tandem bicycle; a little runabout conveyance, \$3,000 tonneau, it will be condoned in finally, with baggage room behind and consideration of the price. Has it power



SIDE VIEW SHOWING DRIVING STEERING AND BRAKING MECHANISM.

from the seat; a machine of which the working parts are plainly in sight, always begging for study and inspection; a motor placed where the horse formerly was—

space for a feed or two of gasoline. These are the first impressions which the beholder receives of the Crestmobile, and they are verified by closer investigation.

enough? That is the main question which arises to the utilitarian buyer. Only extensive trials over hills and through mud will answer it. Has it weak points where

it may be expected to break down, causing frequent and annoying repairs? It weighs only 550 pounds. The horse power is only 3 1-2. Its maximum speed is only 20 miles. In the last item lies a great protection against breakdowns of frame parts, a great taming-down of the high-pitched engineering requirements which follow in the wake of high power and high speed.

Of interesting details may be mentioned a device for flushing the motor with air by raising the exhaust valve, thereby also cutting out the electric spark. This can be operated from the seat and is of value when the motor does not work satisfactorily. The starting device consists of a drum with ratchet and spring, mounted

The countershaft on which the speed gear is hung revolves in a "universal" ball bearing device which permits of taking up wear and enables the shaft to align itself automatically when the frame is twisted by inequalities of the road surface.

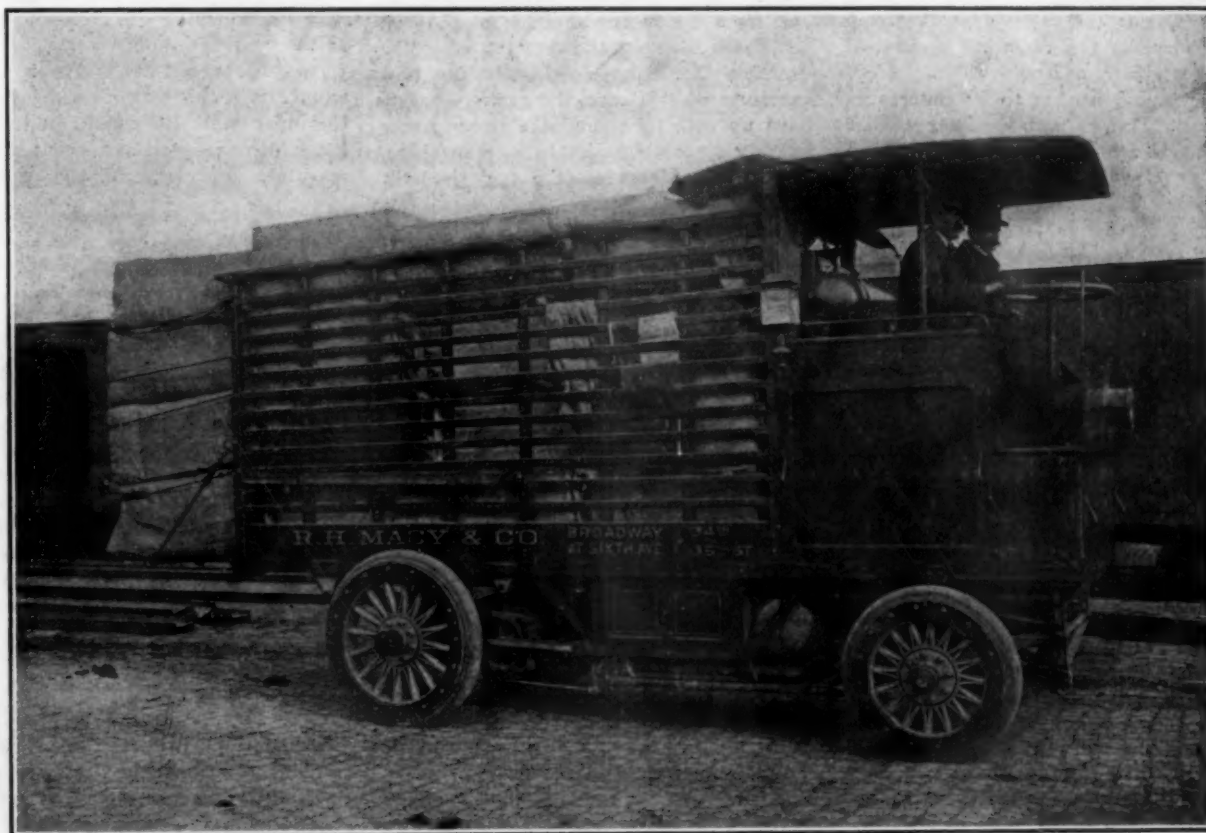
MOTOR TRUCKING OF HEAVY MERCHANDISE IN NEW YORK.

The big seven-ton truck loaded with boxes and bales of merchandise shown in the accompanying engraving has been used for heavy trucking since last August by R. H. Macy & Co., the well-known dry goods concern of New York. The wagon is one of the Fischer Motor Vehicle Co.'s combination gasoline and electric trucks,

found in the fact that in event that anything goes wrong with the gasoline motor, the truck does not get stalled on the road and have to be towed to its destination or the repair shop, but can continue on its way upon the reserve force in its storage battery.

Macy & Co. have only this one motor wagon in use at the present time, but those in charge of the delivery department are enthusiastic regarding its efficiency, and look forward to a time, perhaps next spring, when others will be added to the service.

Since the firm moved into its new store on Broadway and Thirty-fourth street several weeks ago, it has been running a motor stage for the purpose of carrying free



SEVEN-TON ELECTRO-GASOLINE TRUCK USED BY R. H. MACY & CO., FOR TRANSFERRING HEAVY GOODS.

on the motor shaft and actuated by a strap which passes into the body of the vehicle within reach of the driver. A spring returns the strap to its wound-up position, but it seems to be a shortcoming that no provision is made for preventing starting when the piston is in a position that might produce the shock incidental to a start in the wrong direction. The strap would be likely to snap. The steering post carries all controls of motor and gears, but the brake control is separate. The transmission of power is by chain from the motor shaft to the change speed gear and thence back to two sprockets on the differential gear. By an expansion ring clutch either the small or the larger sprocket on the differential may be driven.

and is used by Macy & Co. for their heaviest work, such as transferring goods in bulk from freight cars to warehouses and from the company's warehouses to its retail stores. In this work it has at times carried as much as ten tons in one load.

Regarding the service it is called upon to perform, the superintendent of Macy's shipping department states that it does not make regular trips on schedule, and that no data is kept of the work it performs, but its longest trips are to the company's store in Harlem, six miles up and back, of which it sometimes makes three in a day. As compared with horse-drawn wagons, it is said to be faster, making, with full load, an average speed of five miles an hour. A great advantage is

of charge to the new location such customers as may, through forgetfulness or ignorance of the change, go to the old store at Sixth avenue and Fourteenth street.

Motorists of Harrisburg, Pa., are greatly stirred over a proposed ordinance requiring licenses to be secured from a board of examiners, the affixing of a numbered license badge to the coat of the operator in a conspicuous place, limiting the speed to seven miles an hour on the streets and to four miles in rounding corners, and providing that every automobile shall be fitted with two brakes powerful enough to bring the machine to a stop in ten feet when going at full speed.

The Gasoline Vehicle in Detail.

XVI—THE CIRCULATORY SYSTEM.

The stationary gas engine is cooled either by a stream of water under pressure from a constant source of supply, or by gravity circulation from a tank above the engine. If the tank is used, it is made large enough to disperse the gathered heat of the water by radiation without boiling. The tank system was that applied to the early gasoline vehicles; but, as the tank capacity was necessarily very limited, the water was allowed to boil away, and the tank refilled as often as necessary. As this involved not only frequent and annoying stops for water, but the constant danger of neglecting the tank too long and overheating the engine, the next step was to increase the radiating surface of the tank by piercing it with tubes, soldering sheet metal flanges to its outer surfaces, etc. It was found, however, that no ordinary conditions of this sort would altogether prevent boiling, especially if the

number of very small tubes, about the size of a small lead pencil, laid side by side, with elongated flanges extending around the whole series.

In some machines, the use of these separate radiator tubes is dispensed with, the radiator and tank being combined in one structure. When this is done, the tank is placed at the front of the motor bonnet, which then is usually of box-like contour, and the tank is pierced with a very large number of small tubes, extending horizontally from front to rear. The length of the tank from front to rear is but a few inches, and a fan, driven by belt from the motor shaft, is placed just back of it to assist the draught when the vehicle is traveling slowly. In the best examples of this sort, the tank is nearly filled up with tubes and the water never has a chance to boil. In one machine, indeed—the Mercedes—the tank is built

is the rotary or gear pump, so called because it consists in essence of two gears, with large teeth meshing with each other and fitting in a water-tight case. As the gears are revolved, water is carried around in the space between their teeth at the ends of the case. The teeth entering mesh force out the water between them, and those leaving mesh take up water, so that a constant stream of water is carried from one side to the other of the gears. This pump is run at a relatively moderate speed, and the same is true of the pump shown in Fig. 1. This consists of a central hub, *A*, bisected by a vane, *B*. *A* revolves in a casing, *C*, of approximately circular form inside, and touches or nearly touches the wall of the latter at *D*. As it revolves, *B* slips from side to side in *A* to accommodate itself to the wall of *C*, and water is drawn in at *E* and discharged at *F*. As may be seen from Fig. 1, this pump has the defect that the inner wall of *C* cannot be truly circular, which makes it somewhat difficult to machine. Furthermore, the ends of *B*

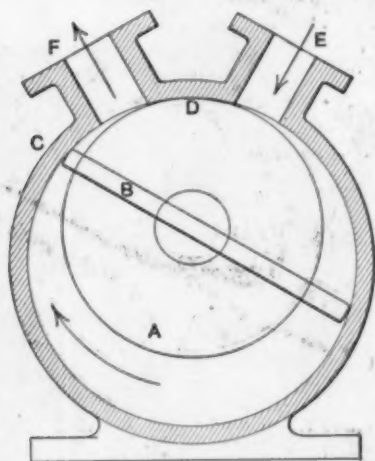


FIG. 1—ECCENTRIC ROTARY PUMP.

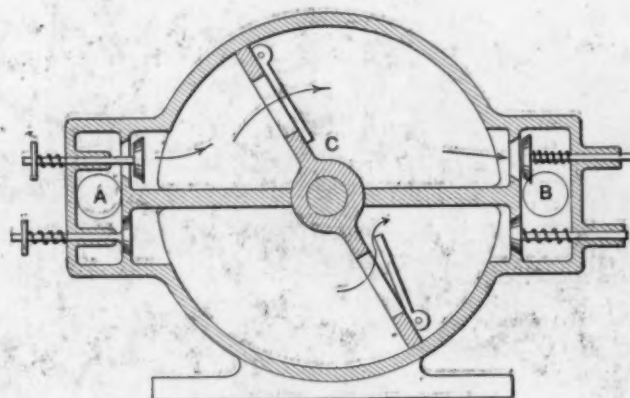


FIG. 2—OSCILLATORY PUMP WITH VALVES.

vehicle was run for long periods on the low gear, with the motor running rapidly and very little draught of air to assist the cooling. Consequently, the next step, which was first taken in France, was to insert in the piping system a considerable length of small copper tubing, with wide and thin copper flanges strung closely together on it and soldered, thus producing a greatly extended radiating surface, which, by bending the tube in zigzag form back and forth upon itself, could be contained in relatively small compass. This radiator, as it came to be called, was usually placed at the extreme front of the machine, where the air would pass through it, with the utmost freedom; and this location, in the front or sides of the motor bonnet or just forward of the front axle, it has retained to the present time. Instead of the flanges helices of wire, wound around the pipe and soldered to it, are sometimes used instead and the latest French device is to use a considerable

up of an enormous number of small tubes of square section, soldered to each other in layers, as it were, the layers being separated by small wires soldered between them at front and back, so that not more than a couple of quarts of water is carried for 40 horse power engine. This carries weight economy to its limit, but is open to the objection that with the smallest leak the water is quickly lost.

SOME PUMP DESIGNS.

With the radiator tubes as usually arranged, the piping circuit is so long and so constricted that artificial means are necessary to force the water through it with sufficient rapidity, both to keep it from boiling and to attain the highest efficiency in the radiator. For this purpose pumps are used, driven by gears, chain, belt, or friction pulley from the engine flywheel. These pumps are of many kinds, and run at widely varying speeds. A popular design in this country wear and leak from the constant rubbing

they undergo. Both of these defects may be avoided by dividing *B* and pressing its ends outward against *C* by a spring between them. Another pump somewhat resembling this one, was illustrated in the issue of June 28 last, on page 7. It has the advantage that all the surfaces may be circular, and with accurate workmanship there need be no rubbing.

An oscillatory pump, the principle of which is employed more or less abroad, is sketched in Fig. 2. Here the water enters at *A* and is discharged at *B*. The oscillating vane or piston, *C*, contains two flat valves working in the same direction, and the two draw water alternately from the upper and lower check valves at the left end, and discharge it through the valves at the right end. The oscillating motion required by *C* is imparted by attaching a crank to the end of this shaft, the crank being connected by a link to a crankpin or eccentric of shorter throw on some convenient shaft of the motor.

The centrifugal pump, which, all things considered, is probably the best suited to this class of work, is sketched in Fig. 3. It consists of a casing, *A*, and a disk, *B*,

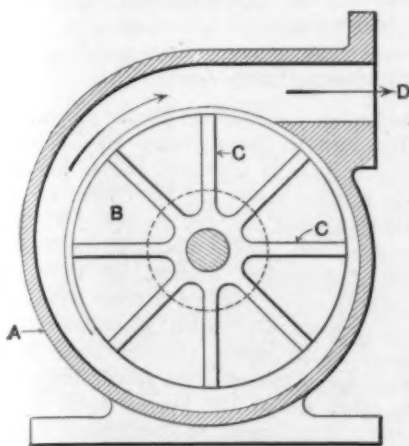


FIG. 3—CENTRIFUGAL PUMP.

the latter being mounted on one end of a shaft, which has a long bearing and stuffing box on the side of the pump away from the observer. On the side toward the observer the case has a cover, with a central inlet pipe, which admits water to the center of *B*, over the space indicated by the dotted circle. In the best construction, *B* is a disk, flat on one side, and having the ribs *C C* raised from its surface. These, when the disk is rapidly rotated, drive the water by centrifugal force to the side of the casing and out at *B*. In some pumps of this kind the ribs, *C*, are curved backward at their ends, with the idea of contributing still further to the pressure on the water.

The centrifugal pump, unlike most others, is not a positive mechanism. It has no valves and no water-tight rubbing surfaces, except the shaft. The disk, *B*, and the ribs may, and usually do, have a clearance of 1-32 or 1-16 of an inch all around, and never require repacking. The pump establishes a pressure, and that is all. Such being the case, if the tank is (as it should be) above the pump, the water will obviously continue to circulate, even if the pump stops turning. Moreover, if the pipe becomes clogged, the pump can still turn without wrecking anything. On account of the high speed on which it turns, the shaft bearings are subject to wear and need to be looked after; but the pump part has no friction and never wears out. These pumps are made very small, and run at speeds from 1,000 to 2,000 R. P. M., at which speeds they throw large streams of water.

LOCATING THE TANK AND PUMP.

The arrangement of motor, cooler, tank and pump may be modified in various ways according to convenience, and to what considerations of operation are considered most important. It may be said at the outset that no arrangement involving the placing of the pump above the level of the water in the tank should be

considered for an instant. None of the pumps which experience has shown to be suitable for this work are so positive that they can be depended on always to lift the water. The latter should always flow to the pump, and by a pipe of good size at that, so that the pump cannot possibly discharge faster than gravity supplies it. Again, annoying delays and even damage to the motor may frequently be avoided by placing the tank above the engine and using a pump which will permit the water to flow through it if it stops.

What might seem the most logical arrangement would be to pass the water from the engine directly through the radiator, it being then at its highest temperature, and the radiator consequently having its maximum efficiency. With this arrangement the water would usually pass from the radiator to the tank, and thence by way of the pump back again to the engine. The objection to this system, however, is that it makes it inconvenient to provide for the escape of steam which may form in the engine jacket. The water must be forced through the radiator under pressure, which makes it impractical to discharge the water from the engine into a funnel or box open to the air, from which the steam might escape. On this account it is best, if the engine is above the tank, to have the water returned directly from the former to the latter after passing through the funnel for steam escape, as the return pipe can be made large enough so that pressure is not needed to force the water from the funnel to the tank. Of course, in such a case, the circulation is wholly dependent on the pump. If, as is much better, the tank is above the engine, the pipe from the engine may rise directly to the tank, the steam, if not condensed in the tank, escaping

pump direct or through the radiator, and then to the pump. The latter arrangement is well enough if the several pipes of the radiator are arranged in multiple, and the radiator is below the tank, so that the water descends naturally to the pump and encounters little resistance in the radiator. If, however, the radiator pipes are in series, the water should go directly from the tank to the pump, even if it is quite hot, as there is less danger of the pump's suction converting it into steam that way than the other. This done, the radiator is placed between the pump and the engine. This is the arrangement shown in diagram in Fig. 4, and, all things considered, is doubtless the best where a pump is used.

It is very desirable that the operator have some positive means of knowing whether or not the water is circulating properly. If the tank is below the motor, this may be done by mounting the steam discharge funnel or box on the back of the dash, where the water flowing through it can always be seen; but a simpler and neater arrangement, applicable whatever the location of the tank, is to have a manometer or pressure gauge indicating inches of water mounted on the back of the dash and connected with the piping system just beyond the pump. Where the latter is driven by friction this is especially useful.

GRAVITY OR THERMOSIPHON SYSTEM.

As the principal reason why a circulating pump is required is the resistance of the long coils of radiator tubes and the long piping where the tank is carried at the back of the machine, the query is obvious: Why not place the radiator tubes in multiple, put the tank above the motor and close to it, and discard the

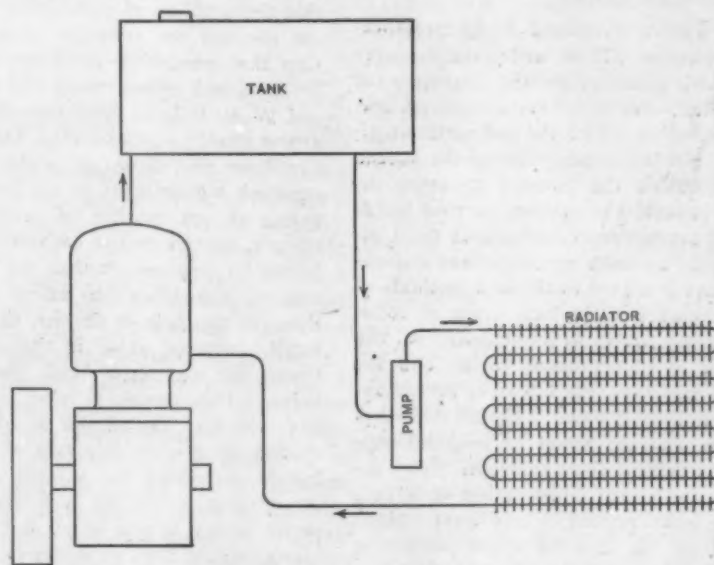


DIAGRAM SHOWING FLOW OF WATER THROUGH SYSTEM.

from the top of the former, which is then open to the air. This necessitates passing the water from the tank either to the

pump altogether? This, in fact, is done in some machines both at home and abroad, and in some cases at least so suc-

cessfully as to prove that gravity circulation may be made much more reliable and generally satisfactory than the pump. Its only substantial drawbacks are the fact that it is not always convenient, especially in a large machine, to put the tank above the motor, and the fact that a rather greater length of radiator tubing is required for a given size of motor, on account of the slow movement of the water in the tubes. Wherever it can be applied it has the very substantial advantage of relieving the operator's mind of all anxiety about the circulation, and protecting the engine absolutely, so long as the tank is not allowed to get empty, from all the troubles incident to the loss of water and overheating, such as burning and warping of the exhaust valve, sticking and cutting of the piston and rings, and possible warping of the cylinder.

BROWNLOW'S NATIONAL BILL FOR PUBLIC ROAD BUREAU.

WASHINGTON, D. C., Dec. 8.—The first bill introduced at the beginning of the present session of Congress was that of Representative Brownlow, asking for an appropriation of \$20,000,000 to create in the Department of Agriculture a bureau to be known as the Bureau of Public Roads, and to provide for a system of national, State and local co-operation in the permanent improvement of the public highways. The general policy of the proposed bureau shall be to bring about, so far as may be, a uniform system of taxation for road purposes and a uniform method of road construction, repair and maintenance throughout the United States, and to co-operate with any State or political subdivision thereof in the actual construction of permanent highways.

The bureau proposed by Representative Brownlow will be under the management and direction of the Secretary of Agriculture and will have a staff of officials, including a director and assistant director. For the maintenance of the bureau and to enable the director to make inquiries in regard to systems of road building and management throughout the United States; to make investigations and experiments in regard to the best methods of road-making and the best kinds of road-making materials; to co-operate in the building of object-lesson roads, and for general expenses, the bill calls for an appropriation of \$75,000. The bill describes how the different States or political subdivisions thereof shall apply for co-operation in the actual construction of a permanent improvement of any public highway within the said State, and prescribes the duties of the bureau in the work cut out for it.

The measure has been referred to the Committee on Agriculture, and its author intends to urge its early consideration.

Expert Discussion of the Oil-Engine Automobiles of 1902*—III.

BY CAPT. C. C. LONGRIDGE.

CARBURETERS AND CARBURETING.

Carbureters and Carbureting.—These are roughly divisible into two systems—aspiration carbureters, and positive-feed carbureters. Of the two, the latter, in the author's opinion, is unquestionably the better system. Most aspiration carbureters draw the petrol from a jet, communicating with a constant-level chamber or reservoir. The result is inaccurate and faulty petrol supply, since the force of the suction varies with the speed of the engine. Rich charges are thus obtained when the engine is racing, and poor charges when it is slowed down from overload, the reverse of what ought to be. Makers are now recognizing this defect, and are introducing devices more or less closely approaching positive measurement. There is no need to describe these latter, because the type is well known in heavy-oil engine work, for instance the Crossley, the Weyman and Hitchcock, the Wells Bros., the Roots, and numbers of other patented devices. As instances of the introduction of positive fuel measurement in petrol motors may be cited the Koch pump, the Gobron-Brillie bucket measurer, the adjustable stop-jet in the Mercedes Simplex of the Cannstatt Daimler Company, a similar device in the De Dion voiturette carbureter, etc. In America quite a number of petrol motors use positive measurers, usually of the pump type; for instance, the Webster, White and Middleton, New Era, Pierce, Springfield, etc.

There is a good deal of evidence to show that the problem of carburation is at present eliciting the attention of inventors—a sign that something yet better is wanted. To take one among many, E. F. Bradley and W. R. Pidgeon have recently published a new design of carbureter, Fig. 1. They found by experiment, as might have been surmised *a priori*, that, to get the maximum power at any number of revolutions per minute, the jet of the carbureter must be larger for low speeds than for high ones, and, as it is difficult to adjust so small a thing as the hole in the jet, they insert a small air-spring valve in the air-pipe between the carbureter and the induction valve. This auxiliary valve opens wider and wider as the engine speed increases, closing again as it decreases, thus decreasing or increasing the suction on the jet. At starting, as the jet is a large one, the petrol supply is also large, and the engine starts readily, then as it speeds up the air-valve comes into action, and automatically letting in more air reduces the mixture to

and maintains it at the proper proportions. The idea of an auxiliary air-supply for this purpose is not new, and is found in the 8 horse power De Dion light car, the Darracq light car, the American Holyoke tonneau, etc. In the motors of the Société des Automobiles Crouan, of Paris, the quantity and quality of the gas mixture is so automatically varied according to the speed of the engine, that the force of the explosion increases as the speed diminishes; in other words, the greater force of the piston stroke tends to compensate for the loss in centrifugal power of the flywheel.

A number of recent devices on similar lines show that the tendency of the present motor is, and rightly so, toward discarding the crude action of the suction jet, pure and simple, in favor of positive measurers, preferably under control of the engine governor.

In connection with carburation, the author raises the point whether it be better to carburate the incoming air, or to first introduce the air and then carburate it, that is, add the fuel, at the end of the compression stroke. This latter method avoids all possibility of premature explosion, and thus enables higher compression to be used.¹ On the other hand, it is urged that the charge will be imperfectly mixed, and give imperfect and irregular combustion. The author is doubtful whether for petrol and gasoline there is anything in this objection, or whether, if there is anything, it is not more than discounted by the advantage to be gained. It is certain that a number of petrol motors run, and run successfully, by merely injecting the petrol into the cylinder and letting the air and heat do the rest. An instance is the American Weber gasoline motor. The petrol is drawn from a tank and supplied direct to the cylinder in a fluid state. No vaporizer is used, nor does the petrol come into contact with air until it reaches the combustion chamber.

In the Otto gasoline motor, built by the American company of that name, no carbureter is used. The oil is pumped from an air-tight tank to a valve acted on by the governor. This admits a given quantity to the cylinder, when it is immediately pulverized by the incoming air and rendered explosive. No air reaches the petrol

¹With equal cylinder dimensions, it also supplies a denser charge. One drachm of petrol represents 1,300 cubic inches of vapor. Consequently, by admitting petrol with air, the weight of the latter is proportionately reduced; while by drawing in air only, compressing, and then adding petrol, the charge weight and maximum pressure are correspondingly increased.

*From a paper read before the Institution of Mechanical Engineers in London, England.

on its passage from the tank to the cylinder. In the German Lützký petrol motor of the Maschinen Gesellschaft, Nuremberg, the benzine is conveyed to the cylinder in a liquid state and vaporized per stroke as needed. In fact, in very many German petrol motors care is taken to exclude the air, until the oil reaches the cylinder. This is the case even where a separate vaporizer is used. Thus in the oil motor of Dopp Bros., Berlin, each charge of oil is separately converted into vapor without any air, and highly superheated before it is admitted, in finely divided currents, to the combustion space, where it is mixed with air. Herr Dopp claims that this method insures regularity and completeness of combustion, low oil consumption, and quiet regular working without vibration. In the Russian Kablitz motor car also, naphtha is injected into a red-hot vaporizer open to the cylinder, and immediately vaporized by the compressed air. Injection of the fuel at the end of compression is adopted in the Diesel mo-

yet be obtained. This point has not been lost sight of, and quite a number of combination carbureters for the double purpose have lately appeared; but experience as to their efficiency is still wanting. With Russian oils there ought to be no difficulty, since these are sufficiently pure to require no more preparation than atomizing and vaporization effected by an easy application of heat. Indeed it appears doubtful whether even vaporization is needed or mere spraying would not suffice. On this question the Specification No. 7,538, 1895, of James Roots, furnishes some information. It states: "I have found by experiment when oil is sprayed into a working cylinder that the essential thing is ignition, as the oil has not time to be and is not vaporized, but is fired as oil spray, and that once the ignition is commenced the flame passes almost as rapidly through the particles of oil, as oil spray, as through a completely vaporized and mixed charge of oil. . . ."

It does not appear that Mr. Roots has

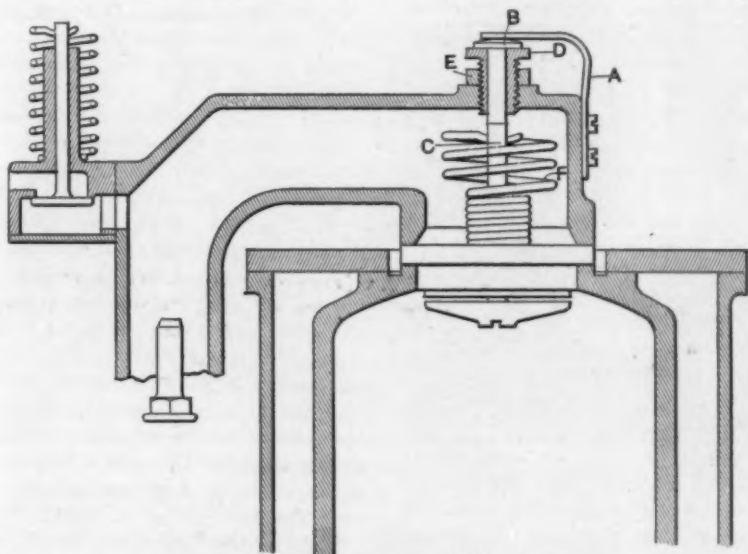


Fig. 1—MORS SYSTEM OF VOLUME THROTTLING.

AA throttle valves on induction pipes; BB valve levers, C valve shaft, operating under the action of governor D. Of the two springs E and F, the former is the stronger, and tends to open the valves. By the use of these springs, the valve action is more sensitive than when the governor alone is used.

tor, but in rather a different way and with a different object. On the whole, the author thinks that, for petrol at least, a good deal more stress is laid on pre-mixing than need be, and that carburation at the end of the stroke, inasmuch as it admits the use of higher compressions and has another important advantage, is probably as good if not better and more economical than the more ordinary method. It probably requires high compression.

The last point to be considered under the heading of carbureting is the use of heavy oils with higher flash-point, the usual household lighting oils. It would be, if not in the near future a requirement on the score of price, at least a convenience in this country if motors were adapted to use such oils as well as petrol; for the Indian trade it is *sine quâ non*, since petrol cannot

since found reason to alter this statement. For Russian refined oils, therefore, a combination carbureter presents no great difficulties. With American oils it might not be so easy to get satisfactory results without special vaporizers. These oils are "cut" differently, and contain waxy and resinous compounds that in long and continuous running would form deposits on the walls and valves. The conditions for successful use would appear to be: uniform delivery of minutely atomized oil in correct proportion, high cylinder temperature, no condensation by contact with cool surfaces, sufficient time for combustion. For alcohol, similar conditions, with higher compression, appear best suited.²

²In the Wartburg lorry of the Fahrzeugfabrik, Eisenach, the motor is so constructed that the compression ratio can be changed from 1 to 4.4 for petrol, and 1 to 5.4 for alcohol.

Correspondence

The Two-Cycle Engine.

Editor THE AUTOMOBILE:

Sir:—Will you kindly state the objections to using a two-cycle engine for automobile use? Also is the jump spark ignition practicable for a two-cylinder two-cycle engine?

H. W. HUBBARD.

Middletown, Ct.

[No one, with possibly one or two exceptions, seems thus far to have been successful in adapting the two-cycle engine to the extreme variations of load and speed required in automobile propulsion. The explosion engine is not an easy problem in these regards at its best, and the two-cycle engine, taking as it usually does the fresh mixture into the crank case before it is delivered to the cylinder, is peculiarly sensitive to any considerable change in the volume of this mixture. It is best adapted to work in which the load is not reduced less than one-half or two-thirds the full load, and in which a fairly uniform speed can be maintained, as for example, in launch propulsion.]

There is no reason why the jump spark should not be applicable to the two-cycle engine provided the metal around the plug is very thoroughly cooled so that the plug cannot overheat; and provided also that lubrication is sufficiently regular to insure that no excess of oil gets above the piston to foul the plug.—Editor.]

A Correction from England.

Editor THE AUTOMOBILE.

Sir.—I notice in your current issue that you have given the results of the Reliability Trials in England incorrectly. You mention that the Peugeot car has scored 3,313 marks against the Panhard's 3,189 marks. This is quite incorrect, as the 15 horse power Panhard, driven by me in the Reliability Trials scored more marks than any other car in the Trials and the number of marks gained by each are as follows: Panhard, 3,085; Peugeot, 3,013.

I am sure you will not mind my correcting you on this point, as the matter is one of general interest to your readers.

CHARLES JARROTT.

London, Eng.

Timing Clocks for Clubs.

An automatic recording clock is being made to order for the Automobile Club of Great Britain under the superintendency of Colonel Holden, a well-known ordnance and motor engineer. The Automobile Club of France is also endeavoring to obtain a reliable timing device which may be depended upon for accuracy exceeding 1-10 second. After first deciding in favor of the Mors electric timing apparatus the club is now hesitating between it and other models.

Foreign

AUTOMOBILE EXHIBITS AT BRITISH CYCLE SHOWS.

A NOVEL CHANGE-SPEED DEVICE.

Wolseley or Star Machine Will Compete as England's Third String in Bennett Cup Race—Mechanism of Interesting Device for Changing Gear Speed by Insensible Gradations.

Special Correspondence.

LONDON, Nov. 29.—But little of a novel character has come to light through the agency of either the National or Stanley Cycling Club shows, which both close their doors to-day, the one at the Crystal Palace and the other at the Agricultural Hall. At the former exhibition quite half the exhibitionary space was occupied by automobiles made for the purpose.

The Sunbeam Cycle Company is famous in this country for having made so great a success of the oil-tight oil-bath gear case in connection with bicycles here and having great experience in this direction will in future encase the road-driving wheel chains of their automobiles. This is a point in automobile construction which hitherto has to the writer's mind been most shamefully neglected. Chain cases would make from 15 per cent. to 20 per cent. difference in efficiency to a car running in bad weather over our English variations of silex, granite, graveled and oolite road surfaces.

PROMOTING VARIABLE SPEED GEAR.

If I may take a line through a fugitive exhibit at the Stanley Cycle Show the last word is very far from being spoken on the subject of variable speed gears. A particularly ingenious and apparently most efficient change speed gear device was there shown fitted to a bicycle, but which can, when made of heavier proportions, be equally well fitted to a car. Although remarkably simple when grasped, the detail of the gear, if gear it can be termed, is somewhat difficult to convey to the reader without sketches, which I regret I am at present unable to obtain. I will discuss the device as it might be fitted to the engine shaft, or counter-shaft of an automobile, driving thence by chain to the line axle:

On the driving shaft, be it engine shaft or counter-shaft, is keyed a four-point ratchet plate of somewhat unusual form, this plate being set upon the driving shaft immediately in front of a vertical frame passing on each side, but clear of the driving shaft, which for the purposes of illustration may be compared to the cross head guides of a steam engine. In these guides a slide plate is free to move vertically within the limits of a slot cut therein to allow the driving shaft to pass through. This guide frame is placed so that the slide

plate can move up and down just behind the driving ratchet plate fast on the driving shaft. On the ratchet plate side the sliding gear plate carries a disk solid with the plate, and having therein a similar slot to permit vertical movement about the driving shaft. On this solid disk runs a ring on ball bearing and concentrically with this ring is an overhanging flange ring formed on the arms of the driving chain wheel.

GIVES A CONTINUOUS CHANGE.

The outer periphery of the solid ring and the inner periphery of the overhanging flange ring on the chain wheel form a clutch race, in which are placed four clutch blocks at equal distances from each other. These clutch blocks lock the outer and inner paths together by means of top and bottom rollers, moving on opposed inclined planes formed on the upper and under surfaces of the clutch blocks. Pivoted centrally to the outer side of these clutch blocks are pawl arms raking backwards with their lower free ends engaged in a curved pocket shoulder formed to receive them in the edge of the four point ratchet plate mentioned in the beginning as being keyed fast to the driving shaft.

It will therefore be realized that the only connection between the driving shaft and the driving chain wheel is by means of these four pawls having their lower ends in the pockets of the four point ratchet plate on the driving shaft, and being pivoted as to their upper ends centrally to the outer faces of the clutch blocks afore-said.

I trust that I have also made it evident to my readers that as the driving chain wheel is carried on the sliding plate by means of the fixed disk thereon, the ring free to rotate thereon, and the clutch blocks locking this ring to the overhanging clutch ring on the chain wheel arms, that when the sliding plate is by suitable means caused to move up vertically in the guides that the center of the chain wheel is moved away from the center of the driving shaft, with which by means of the slot in the sliding plate and disk solid therewith it can be co-central when desired. When the center of the chain wheel is so removed outside the center of the driving shaft it is obvious that the circumference in which the teeth of the chain wheel rotate is enlarged so that the driving effect thereof upon the driven chain wheel is as though a chain wheel of that exact circumference were fitted. Therefore the driving is geared up to any desired degree permitted by the vertical movement of the slide plate.

ADAPTABLE TO AUTOMOBILES.

At present this simple and ingenious device has only been fitted to the inventor's own bicycle, but I do not perceive any difficulty in adapting it to the propulsion of automobiles. From the fact that the gear is infinitesimally adjustable to

any desired degree between the minimum when the center of the driving shaft and chain-wheel are co-central to the point at which the center of the latter is removed as far as allowed by the length of the vertical slot in the sliding plate and fixed disk, from the center of the shaft, I consider that this form of gear, providing it can be made satisfactorily for the purpose, would prove invaluable to the automobiles propelled by explosion engines.

CLUB DELEGATION TO PARIS.

English automobilists are now looking forward to a visit to the great Automobile Show, which opens in Paris on December 10. A party from the Automobile Club will leave London for Paris on the 12th, and will have its headquarters while in the gay city at the Elysée Hotel.

The Automobile Club has decreed that of the three cars to do battle for the Gordon Bennett Cup two shall be Napiers, and that the other may be a Wolseley or a Star, the firm making the latter having signified their willingness to build a vehicle for the contest. Selection between the Wolseley and the Star is, I understand, to be made by competition so should it be found possible to conduct this great event in Ireland, we may have a preliminary struggle in that country over the selected course, to decide which Wolseley or Star shall have the honor of forming England's third string.

MOTOR BICYCLES PROGRESSING.

The evidence of the two cycle shows just closed form a conclusive proof that motor-cycling has bounded into public favor. No large cycle manufacturer but exhibited at least one example of a motor-bicycle, and many showed quite a number. On every side a distinct tendency is shown to make the motor bicycle a machine apart in construction and design from the pedal-propelled safety.

Control, too, has been largely simplified. In many cases but one lever serves to cut off, advance and retard ignition and raise exhaust valves. Surface carbureters are being dropped all around in favor of the float jet type. In three instances pedals are abandoned, and foot-rest only provided. Nothing under 2 horse power in motors is regarded, and the day of the pop-gun engine is over. In one case, that of the "Desmond" motor-bicycle, a small tier of flanged radiators is carried in front of the steering tube, and two small water tanks are fitted, one on each side of the top tube.

The petrol question remains *in statu quo* and many districts are suffering from petrol famine. Many others have now made arrangements to obtain supplies from the distributing centers by self-propelled traffic, and having found this much less costly than rail transport, this traffic will now never return to the iron road, which will serve the industry-throttling companies right, all will agree.

ALCOHOL THE SUBJECT OF CONGRESS IN PARIS.

FORMIDABLE ANTI-AUTO LEAGUE.

Krebs Carbureter Considered a Wonder—Men of Science and Industry to Probe Alcohol Questions Deeply—Fournier Still Holds Kilometer Record—Blank Briefs to Persecute Motorists.

Special Correspondence.

PARIS, NOV. 28.—That alcohol has been the slogan of the season just over no one acquainted with the record of the past twelvemonth will question. To sum up its claims, let me simply state that it holds a fair share of the world's speed records and has proved a dynamic efficiency at least equal to that of gasoline, with a slight saving in cost. To crown its successes the government has called an international alcohol congress to be held in connection with the automobile show in the Grand Palais, under the honorary

It may be worthy of remark that Fournier still holds the official kilometer record, at 29 1-5 seconds, as the record of Augières at 29 seconds flat, though officially timed, was not separately timed, but taken in conjunction with his mile record of 46 seconds, and therefore not recognized by the Automobile Club of France.

STAGES AND BUSES PROVED GOOD.

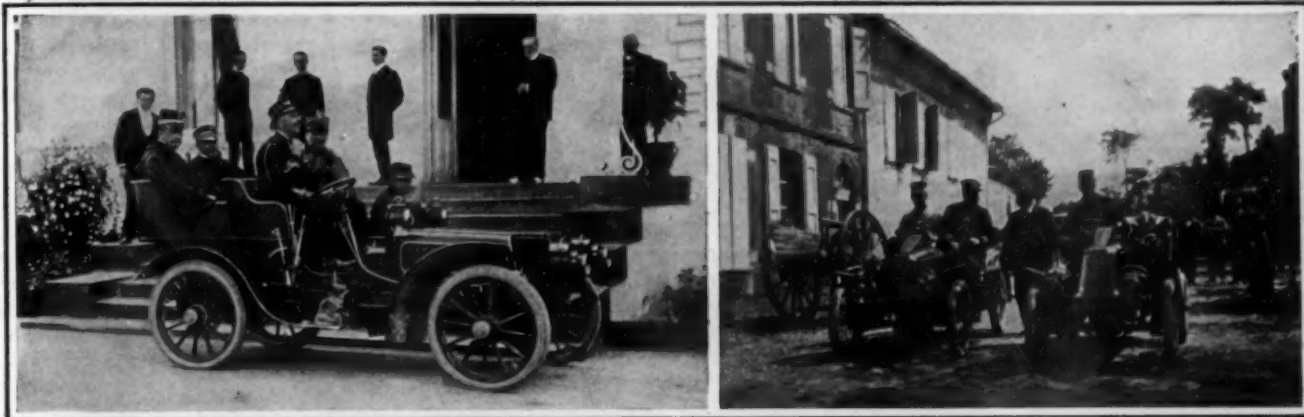
In the recent 6-day reliability contest for urban and suburban "traffic automobiles" the Gillet-Forest, the Peugeot and the Huber firms gained special honors. Of the twenty cars entered seventeen, in fact, passed through the ordeal, proving themselves economical and reliable at moderate speed. But of this interesting contest you will receive a more satisfactory account through our automobile journals.

A great deal of technical interest is at present centered in a new carbureter brought out by Mr. Krebs, so long connected as chief engineer with the Panhard

Foreign Notes.

Following its own example of last spring the Automobile Club of France will organize a second contest for omnibuses and other heavy-weight vehicles in connection with the automobile festival at Nice in March, 1903. The heavy vehicles will carry their passengers and loads from Paris to Monte Carlo, a distance of 680 miles by the route selected, in eight daily stages. At the comparatively slow pace of this class of machines, much less time will be left for repairs than last year when the route was shorter and the schedule time was eleven days.

Alcohol may now be produced by synthetic chemical action from acetylene or calcium carbide, and the growers of beets, grapes and fruits in Brittany, France, who have furnished most of the material for the alcohol production in that country, are getting alarmed and ask for a heavy import duty on carbides. Perhaps their petition is also actuated by fear that acetylene gas-



FROM THE MILITARY MANOEUVRES IN SOUTHWESTERN FRANCE.

H. R. H. the Prince of Asturias Leaving His Quarters.

Decauville Used for Despatch Service—After Sham Battle.

presidency of M. Mougeot, the Minister of Agriculture, and under the chairmanship of that distinguished savant, M. Michel Lévy.

The promoters of this congress have a scientific and practical aim, which is to gather in the same spot and on the same date all those who feel interested—at home and abroad—in alcohol as a means for locomotion, illumination, heating and other industrial and economical purposes. The work will be divided in five sections. Section 1 will deal with automobile matters; the engine dimensions, the consumption, ignition, cooling and lubrication. Section 2 will consider stationary motors designed for alcohol fuel. Lighting and heating problems fall under section 3, and the Chemical section, section 4, will consider the various methods for "denaturizing" alcohol and preparing special mixtures or combination fuels. Section 5 will tackle the politico-economical matters, including the laws and ordinances relating to alcohol, the national interests involved in the various countries and the best methods for stimulating the use of alcohol.

firm. It is considered a wonder, but I have not yet had an opportunity to examine it in operation.

Enemies of the motor car—or at least of fast driving—have taken a new, vigorous step. They have formed a League patterned after the societies for the protection of animals, and the daily press is very friendly to it. The League supplies its members with blank warrants or complaints that enable them to drag any offending motorist before a Magistrate without going to the trouble usually involved in this step. Granted the consent of the government—which has not yet been obtained—this would turn every league member into a police officer, minus the uniform. This matter has assumed a political aspect, as it has been taken up by the anti-semitic faction, who contend that the wilful contempt for the rights of others and for human lives not their own, is a characteristic trait of automobilists of the Hebrew race. Probably this intermixture of racial and religious quarrels with motor matters will kill the League. All reasonable persons at least hope so.

may take the place of alcohol as a motor fuel.

According to statistic data by the French Customs Department, automobiles reaching a total value of 19,891,000 francs, or about \$4,000,000, were exported from France between January 1 and August 1 this year. The value is estimated at 10 francs per kilogram, as the actual money value is not considered for export, but only the weight.

Plans are said to be under way for a huge storage station or garage almost in the center of the city of London. The designs contemplate a capacity of 700 motor cars, a court where 50 cars can be cleaned simultaneously and a hydraulic lift which will hoist four large machines on the same platform.

An international motor association, with the leading automobilists of Germany, Austria and France as chief members, is in formation in order to advance the sport in these countries in a uniform manner and to attend the rides promoted by the leading corporations.

MOTOR BOATS

LARGER MOTORS DEMANDED FOR GASOLINE AUXILIARIES.

KEYNOTE TO A NEW SITUATION.

Realizing that Reliable Gasoline Motors of High Power Are Now Produced for Automobiles, Owners of Craft of Considerable Size Look for Marine Motors Up to 100 Horse-Power.

Entirely apart from the rapidly growing demand for power craft of the conventional launch type in sizes from 15 feet to 75 feet and over there has sprung up within only a couple of years a demand for auxiliary sailing yachts of a size and type previously unknown. In many cases sailing craft, both yachts and working boats, have been fitted with gasoline motors, while a very large number of new yachts and not a few fishing craft have been specially designed for such motors as auxiliary power. The auxiliary schooner of 70 to 90 tons has to all appearances proved a complete success in the Eastern fishing fleet, and at the same time a number of schooner yachts of about the same size have been built and more are planned for this season.

The origin of this class of vessel is due directly to the improvement of the gasoline motor; while a few steam auxiliaries are found, the class as a whole would be insignificant if it depended on steam alone. While the most compact steam plant must of necessity monopolize a large space in the most valuable part of the vessel, with the serious disadvantages of weight, heat, smoke, ashes and dirt, the gasoline motor of equivalent power may be located in a closed compartment below deck in a portion of the vessel which is almost useless, and when in use it is free from heat and fire alike.

The stock products of the leading builders have thus far sufficed for the general demand for auxiliary motors for sailing vessels, but it is already evident that a larger class of auxiliary is coming into favor, from 75 to 100 feet waterline, for which is required a better and more reliable gasoline motor than is commonly found in the market. The prevailing demand for motors of 3 to 35 horse power for ordinary launch use has induced builders to concentrate their attention on these smaller sizes, but the time has come when it will pay them to give at least as much attention to motors of 50 to 100 horse power.

The practical limit of the gasoline motor for both land and marine use is as yet undetermined, and it is quite possible that for the latter it may prove to be very much larger than anything yet tried. If this is the case, so much the better, but for the immediate present there is ample field

for improvement in marine motors of only moderate power. The weight may probably be decreased, though this is but secondary, and the efficiency and above all the reliability may be very greatly increased. The demand in this class of work is not for motors of such power as to give a high speed, but for quiet, compact, reliable and economical motors which will drive a yacht at a very moderate speed, from four to ten miles per hour. In this class of vessel primarily designed for propulsion by sails, the form is such as to be very easily driven at moderate speeds, so that the engineering problem is by no means a difficult one, the great point being certainty of operation. With the attention of the makers once concentrated on this class of motor it is not too much to expect such improvements as will in time even displace steam in those larger auxiliaries in which it has thus far enjoyed a monopoly.

BRITISH MARINE MOTOR ASSOCIATION FOSTERS RACING.

It should be a matter of no small interest to American launch users and builders that in spite of the widespread use of all classes of small launches in this country for some years, both England and France are now ahead of us in concerted efforts to promote launch racing. Coincident with the perfection of the explosion motor in France and the development of the motor vehicle, there has grown up a type of special racing launch which has become very popular; a type as yet unknown in this country and England. In the latter country steam has been the principal power for even the smaller launches until a recent date, when various motors using kerosene, there called paraffin, were installed in yacht dinghies and other small craft. Within the past year there has been a very lively demand for gasoline motors, from which a number of American builders have profited greatly, large numbers of various makes having been sold. The leading British yachting journal, *The Yachtsman*, took up the subject of launches about a year ago in a special department devoted to marine motor news, and since that time it has done excellent work in calling attention to the new sport and in uniting launch users.

For several months past *The Yachtsman* has been agitating the question of an association of launch users, similar to the Yacht Racing Association, which since 1875 has directed the interests of sailing yachts. The preliminary meeting for the organization of such an association was held in London on November 13, and after discussion it was decided to form a permanent body under the name of the Marine Motor Association. It was at first proposed to include the word "Racing," but the final decision was against it. The object of the new association is to encour-

age the development of marine motors and to promote the sport of marine motor racing. Only a preliminary organization was effected, Mr. Linton Hope, the well-known designer of small yachts, acting as temporary secretary and treasurer, while a committee of organization was appointed to draw up constitution and by-laws, the following being named: Captain E. du Boulay, G. A. McLean Buckley, E. Campbell Muir, E. H. Hamilton, Captain R. T. Dixon, Walter Kirby, A. Evans, A. Westmacott and Linton Hope.

A WIDE FIELD FOR GOOD WORK.

Some general points were decided on, that candidates should be elected by a council, and that a meeting should be held every month; the annual fee and also the initiation fee to be each one guinea. For the present the association will deal only with launches, which will be divided into two main classes, cruising or service launches and racing launches. It is proposed to further divide the service section into four classes: 1, dinghy class not exceeding 15 feet over all; 2, launches not over 20 feet over all; 3, launches not over 25 feet over all; 4, launches not over 30 feet over all. There will be in each class a minimum limit to breadth and freeboard and to thickness of planking, also a maximum limit to power.

The racing section will be divided into two classes, with no supplementary restrictions: 25 feet length over all and 40 feet length over all. The association will probably appoint officers to supervise speed tests and to award official certificates of speed. The whole subject of measurement rules and allowances for launch racing has been discussed for some time past in *The Yachtsman*, many proposals being advanced. None of these as yet are satisfactory and the association is likely to find a difficult task before it; however, there is a wide field for good work, and the movement is very timely just at present.

Motor Marine News Notes.

Byron Bailey, of Boston, has ordered of Charles Ferguson, the Groton boat builder, a launch 28 feet long, 6 feet 6 inches breadth, to be fitted with a 7 1/2 horse power motor. The trim will be of mahogany and antique oak.

The Newport shipyard has begun work on an auxiliary yawl for Dr. Charlton, of Savannah, Ga., from designs by William Hand, Jr., of New Bedford, Mass. The yawl will have a lead keel, will be 36 feet over all, and of shallow draught to allow her use in southern waters.

A large addition to the R. A. Cook machine shop at Stevens Point, Wis., has been completed and work on stationary gas engines and gasoline engines for launches will be started at once. Expert machinists from New York State are expected to take charge of the plant.

LATE NOVEMBER FLOWER PARADE IN HOUSTON, TEXAS.

In spite of rather disagreeable climatic conditions, automobile enthusiasts of the city of Houston, Texas, held on November 21, what they termed the First Annual Automobile Parade. The many flower-bedecked vehicles attracted a great deal of attention, and all Houston was out to watch the procession and to applaud the passing of every skillfully handled and artistically decorated vehicle. Almost a score of carriages were in line, and to add

charm to the artistic arrangement, so that the turnout was very handsome and well deserving of the \$100 prize it won.

The second prize of \$75 was won by a Waverley runabout, driven by Miss Bonnie Adams, and carrying Mayor O. T. Holt. This carriage, which is entered by the Houston Automobile Company, was decorated in violets with white doves overhead, representing love for the Lone Star State. Silver stars completed the scheme and added to the attractiveness.

A locomobile, driven by Mrs. H. C. Sherrod, and owned by the Houston Au-

McClellan, of the No-Tsu-Oh Association. It was driven by Mrs. Adams, and was not entered in the prize competition. It was very handsomely decorated in white roses.

At this late season of the year, when the motorists of the northern cities are wearing heavy furs and courting pneumonia* by braving fierce northerly winds that drive the mercury down dangerously near to the zero mark, the thoughtful outdoor enthusiast, when he thinks of the Texas motorists participating in a flower parade in late November attired in light



PRIZE WINNING AUTOMOBILES IN FLORAL PARADE AT HOUSTON, TEXAS.

Official Carriage Driven by Mrs. L. M. Adams, Chairman Parade Committee.
Winner Fourth Prize of \$25, Driven by Mrs. H. C. Sherron.

Winner First Prize of \$100, Driven by Miss Blanch Myers.
Winner Second Prize of \$75, Driven by Miss Bonnie Adams.

to the charm of the flowers a number of them contained some of Houston's fairest young women.

A Toledo surrey, owned and driven by Miss Blanche Myers, proved the winner of first prize. Miss Myers' handsome surrey was especially attractive because of the two pretty lady occupants and by a very tasty arrangement of red roses. The gaudy butterflies which were hitched to the car by purple ribbons lent still another

tomobile Company, proved the winner of the \$25 which constituted the third prize. Mrs. Sherrod's car was trimmed with white ribbon and decorated in pink roses and Spanish moss.

Another very pretty car was the official carriage, a Toledo dos-a-dos, owned by Mrs. L. M. Adams, Chairman of the Flower Parade. It contained the king and queen of the parade, Mr. Jesse Jones and Miss Clara Robinson, and President

summer suits and fluffy white dresses, is apt to tell himself that Texas folk are favored in some respects at any rate.

The most popular country road for Buffalo motorists next year will be the recently improved State highway to Williamsville, connecting with the Transit Road. The route will continue on to Lockport and will have Olcott, a famous Lake Ontario resort, as a terminus.

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SATURDAY, DECEMBER 13, 1902.

THE LICENSE QUESTION.

Avowedly with the purpose of forestalling local and State laws requiring a license for operators of motor vehicles, the National Association of Automobile Manufacturers has passed a resolution appointing a committee of one to call upon Senators and Congressmen in Washington for the purpose of securing prompt and favorable action upon a petition from the association asking the Senate and House of Representatives to prepare and pass a bill providing for a national license for drivers of automobiles.

At the same time, the Automobile Club of America has gone on record, through the remarks of its president before an aldermanic committee in New York City, as favoring a State license.

The American Automobile Association has expressed no preference as yet; and the American Motor League, which is supposed to be the organization representing the interests of automobilists most directly, is also mute on the subject. In fact, both the A. A. A. and the A. M. L. are prevented from taking quick and decisive action on any subject of large scope by reason of the geographical difficulties in obtaining a quorum of their directors.

It remained for the two bodies who were in a position for taking action to arrive at some conclusion in regard to what should be done in order to obviate the intolerable condition resulting from the disposition of local communities to pass conflicting laws in regulation of motor vehicle traffic. That their preferences were at variance seems to indicate a split of convictions on a most important subject, and this split may be found to exist also among those most deeply concerned in the proposed legislation, viz., the large

body of automobile owners and drivers, to say nothing of the public at large.

It is even possible that the disagreement among motorists, in regard to the best method of regulating automobile traffic and preventing arbitrary local restrictions, is much deeper than the little difference which separates the N. A. A. M. and the A. C. A. These bodies agree, after all, on the essential point that a license system is desirable, and both would like to see the license legislation so framed that it would cover the whole subject of traffic regulation acceptably, and to the exclusion of local interference.

But among motorists and the public in general there may be thousands and even millions who have no confidence in a license system, or who consider a "national license" wholly impracticable, whether as a substitute for other restrictions or for no restrictions at all.

To set the machinery of the national government in motion for either dispensing or revoking a permit to a rider of a motor bicycle, does not seem to everybody to be in the fitting order of things. Violations of national laws fall under courts of special jurisdiction; this, too, might seem awkward in cases of petty offense. Probably considerations of this nature would quickly suggest that the desired national legislation should aim merely to bring about uniform action by the States, similarly as the first automobile State law of New York was designed to make the counties fall in line in regard to speed limits. But here, again, there is a certain disproportion between the object of the proposed legislation and the momentous constitutional questions to which it would give rise. The Federal Government has small authority over the legislative assemblies of the States.

At all events, it is safe to say that unanimity of opinion on the desirability of a national license law can hardly be supposed to exist among motorists and the public in general, and the resolution of the N. A. A. M. derives its importance not from any brief, express or implied, which this association may hold to speak for the 30,000 motorists of this country, but solely from its intention to place the matter under deliberation by the most intelligent body of men representing the interests of the people at large.

By bringing the question of automobile traffic regulation to their attention, it seems to have been recognized to some extent that the time has passed when automobilists should lobby for special privileges in aldermanic chambers and the corridors of State Legislatures, and that all who cultivate automobilism should be willing to rank themselves as citizens first and motorists afterward; as part and parcel of the body politic, and not a faction opposed to the interests of the majority.

Even those who have no expectation that the Senate and House of Representatives will seriously consider the proposi-

tion of the N. A. A. M. in its present form, may hope that a bill will be framed and that a discussion will follow by the people's representatives sufficiently earnest to assist in crystallizing public opinion on more rational lines than those now usually followed in local circles. For removing the edge of antagonism between promoters and anti-motorists, which crops out too often under the present conditions, nothing could be more effective than a dispassionate discussion of automobilism in relation to national affairs by a set of men accustomed to dealing with large issues.

It is to be hoped that the resolution of the N. A. A. M. will assume a form—before it reaches the floor of the House—which will entitle it to more than perfunctory consideration and burial in a committee; and in this respect it may be worth taking note of the strong movement among British, and also among German, motorists for a national law recognizing neither arbitrary speed limits nor a special license system, but, on the other hand, emphasizing the new moral and legal obligations which arise from ownership and operation of automobiles and the need of enforcing the existing laws with special reference to the new conditions.

PROMOTION OF LAUNCH RACING.

We give at some length on another page reports of the recent proceedings of two bodies of launch users, in England and France, as they relate directly to a work that is much needed in this country. The racing of launches is a comparatively new institution, prior to this year being limited to such rare occasions as the days of water sports during the New York Yacht Club cruise, the Larchmont race week and occasional scrub races in connection with sailing regattas. This year there have been a number of regularly organized launch races in different parts of the country, and it is evident that the sport is soon to assume much greater proportions. While these races are promoted by local yacht clubs, they are held secondary to the sailing events, and but little attention is given to details. The rules up to the present time are very imperfect, and no systematic effort is being made by launch users for their improvement.

But little is to be expected from the average yacht club in this line, and if anything is to be done it must be through the individual exertions of those specially interested in power launches. It should be possible at the present time to bring together a body of launch users from such different localities as to make it fairly representative, for the formation of a national association and the adoption of uniform rules. It is a question whether it is possible at the start to formulate a really fair and satisfactory system of racing measurement for power craft, but this is only another reason for some immedi-

ate effort. Such a rule must be founded on data which are now available and which can only be had by such systematic experimental work as has just been begun in France. One effect of a systematic effort under even a provisional and experimental rule would be to bring about a closer uniformity in the practice of motor builders.

While it is highly essential that an association of this kind should be in the hands of the users, rather than of the builders of launches and motors, both parties are directly interested, and the builders, being already organized to a certain extent and known to each other and to the public, are in the better position to take the initial steps.

MEMBERSHIP FEES REDUCED BY THE ASSOCIATION OF CLUBS.

At a meeting of the governors of the American Automobile Association, held Tuesday evening, December 9, it was decided to reduce the annual dues of the affiliated automobile clubs from \$3 per member to \$1. The initiation fee remains as it was, namely, \$10 for each club. Under the new rate a club of fifty members desiring admission to the national organization will have only \$10 plus \$50 to pay, while formerly the fee would have been \$10 plus \$150, or \$160. This action was taken because many of the clubs, which did not join the national association at the time when it was formed complained that the membership fee was too high, and stated that this constituted the principal reason for their standing apart.

It was also decided to call the annual meeting of the affiliated clubs for January 20, to be held in connection with the Madison Square Garden show in New York.

Heavy Fines for Speeding.

BOSTON, Dec. 9.—Fines of \$50 each against four automobilists held up in the automobile speed trap in the town of Lincoln recently, have surprised the motorists in the Boston district. It turned out that these convictions were under the State law restricting speed to fifteen miles per hour, and not under the Lincoln ordinance limiting it to eight miles; but the fines were so much heavier than those imposed in other cases hereabout recently, that automobilists are inclined to give Lincoln a wide berth.

It is said that Mr. F. E. Stanley, the Newton automobilist, who was arrested and fined last week in the Roxbury court for exceeding the speed limit, was at the time of his arrest running his carriage beside a horse and buggy, with the driver of which he was talking. The horseman was not arrested.

The new 10, 16 and 24 horse power De Dietrich cars, built under Turcat-Méry patents, are said to run perfectly silent.

NO OFFICIAL RECOGNITION OF OLDFIELD'S FAST RUNS.

LOCAL TIMERS CLAIM 'SANCTION.

Time Made By the Ford-Cooper Machine Said to Be Recorded Under Conditions Ratified by the Automobile Club of America or the American Automobile Association.

Special Correspondence.

CLEVELAND, OHIO, Dec. 6.—Charles E. Shanks has received a telegram from Chairman Stewart, of the American Automobile Association, to the effect that the record trials of Barney Oldfield at Detroit will not be sanctioned by the association. This information leaves Alexander Winton, of this city, as the holder of the official record, which he would have lost had the association recognized Oldfield.

The performances of Mr. Oldfield, with the Ford racing machine owned by Tom Cooper, were reported in the December 6 issue of this publication. In view of the efforts made by the Detroit Racing Association to comply with the requirements for establishing an official record and the refusal of the American Automobile Association to grant its sanction, as related by the Cleveland correspondent, the manner of timing and scoring at the Oldfield speed trials gains some importance. The officials were F. J. Gygas, Jr., of Detroit, and Carl J. Metzger, Jr., of Ottawa, Ill., scorers; Dr. R. C. Rudy, William E. Metzger, E. H. Broadwell and J. M. Colquhoun, all of Detroit, timers. Stop watches were used.

LOCAL VERSIONS OF TRIALS.

On the point of official sanction the Detroit reports state: "The successful trial was held on the Grosse Pointe track, sanctioned by the Automobile Club of America," and in another place: "As official permission had already been obtained from the national organization and Mr. Metzger and others in the party were officers of that body, it was considered that all the necessary formality was observed to make the record lasting." The two records made were 1 minute 11-5 seconds for one mile, flying start, and 5 minutes 20 seconds for five miles, flying start. The record of Alexander Winton, which is officially recognized, is 1 minute 21-5 seconds for one mile, flying start, on a circular track.

WHY SANCTION WAS NOT GIVEN.

From these local versions of the trials, the impression has been created that the formalities required for obtaining the sanction of the national organization are too onerous, and that it is useless for Western clubs or racing associations to try to conform to them. To obviate this impression, which would lead to the acceptance of a series of popular speed records, more or less trustworthy, and

clashing with records established under better guarantees, W. E. Scarritt, the president of the A. A. A., was requested to state the reasons why the chairman of the association's racing committee refused to give his sanction. "Sanction was not asked for until after the trials had been held," was his answer, "and much as we should like to establish a new American record, it was impossible to do so under the circumstances. However, Mr. Metzger has now been appointed official timer for any trials that may be held in a near future at Detroit, and there is nothing to hinder the establishment of a new record by repeating the trials. Usually the association limits its sanction in such cases to one week. This takes care of delays due to bad weather and similar unavoidable interferences. But it is evidently not practicable to give official recognition for an indefinite time." The formalities required, as explained by President Scarritt, consist only in requesting the sanction so far ahead of the event as to render it possible to appoint a local representative of the A. A. A. to see that the racing rules are followed.

Talk of Enlarging Boston Clubhouse.

Special Correspondence.

BOSTON, Dec. 8.—There is talk of enlarging the clubhouse of the Massachusetts Automobile Club, on Boylston St. The street floor and basement of the building are now filled with big machines, almost all of those on the street floor having the long-wheel base, which was not in vogue when the building was planned; and with forty-four vehicles now in regular storage at the clubhouse, the Board of Governors is said to be planning for an addition. The governors are looking about to see what can be done, and the turntable which the president, Colonel James T. Soutter, planned last summer to have installed this fall in order to facilitate the turning and running-out of the new long carriages, has been held up pending a decision on the question of an enlargement.

If the enlargement is determined on, it will undoubtedly be planned in such a way that the present main doorway may be used solely as an entrance, while another doorway in the proposed addition will be used only as an exit. A large vacant lot adjoins the clubhouse on the west, with 108 feet frontage on Boylston Street. Part of this lot could probably be obtained for club uses. In fact, the club is said to have an option on it already. The present clubhouse is only about thirty-five feet in width, by ninety feet deep, so the floor space is too narrow for safety or comfort.

An automobile school for those who wish to learn to drive before purchasing is being organized in Philadelphia with good prospects of being in running order with a large number of pupils by the first of the year.

Patents

Cooling Water Regulator.

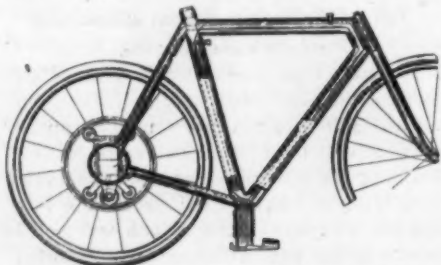
No. 710,385. George Westinghouse, Pittsburgh, Pa.

This is a device intended to be applied to stationary engines or others cooled by a flow of water under pressure, as from a city water supply or by gravity circulation from a tank above the engine. It consists of a thermostat regulator acting on a balanced valve through which the water passes on its way to the cylinder. The thermostat is surrounded by the water passing from the cylinder, and an increase in the temperature of this water opens the valve just mentioned to allow more water to flow.

Hub Motor Bicycle.

No. 709,897. Frank C. Goddard, of Akron, Ohio.

This invention comprises a motor contained inside the hub of the rear wheel, which revolves on rollers or sheaves around it, and is propelled by a pair of



GODDARD'S HUB MOTOR BICYCLE.

pinions on the motor crank shaft, meshing with internal gears in the hub. The motor is cooled by water, which circulates through tubes inside the tubes of the frame. These latter are made to serve as reservoirs for the gasoline and as mixing chambers, the gasoline being warmed by contact with the hot water pipes inside.

Method of Gas Engine Regulation.

No. 712,393.—L. A. C. Letombe, of Paris, France.

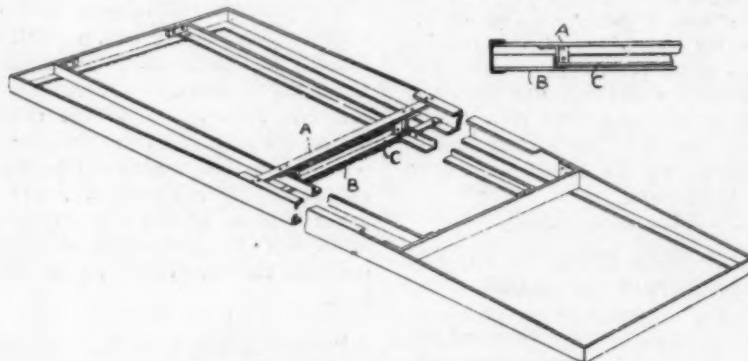
This specification describes mechanism for accomplishing a peculiar method of regulating a gas engine, this method consisting in running the engine normally with a restricted or throttled charge and a rich mixture, the compression being equal to that ordinarily used. To reduce the power of the engine, less gas and more air per stroke are admitted, and the high resulting compression offsets for the purpose of ignition the reduced richness of the charge. In the mechanism described, a gas check valve of ordinary form is used (for which, presumably, a float feed vaporizer, set to give a normal mixture with a very strong suction, could be substituted in a gasoline engine); and the regulating throttle, instead of being between the mixing chamber or vaporizer

and the cylinder, is outside the former, so that opening the throttle, while admitting more air, reduces the suction and consequently the proportion of gas.

Gasoline Vehicle Frame.

No. 711,441. A. L. Riker, Short Hills, N. J., Assignor to the Locomobile Co. of America.

A frame of substantially the construc-



A. L. RIKER'S TAPERED CHANNEL IRON FRAME.

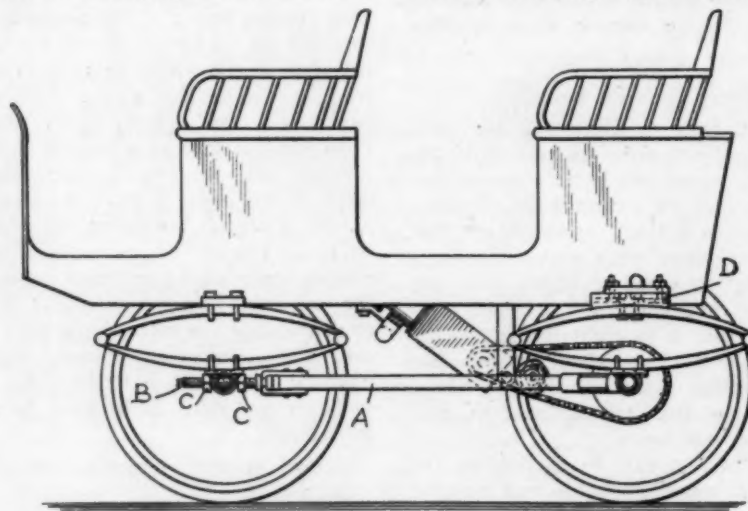
tion shown in the drawing. Its principal feature is the use of channel steel for the side members, the channels being reduced in weight at both ends by being tapered on top, the effect of this tapering process being to cut away the top flange of the channel. The middle section of the channel is left untouched, giving the maximum resistance both to vertical bending stresses and against lateral vibration. The false frame, as shown, is in the plane of the main frame, and the cross sill intersecting it is built up of a top angle strip *A* and bottom strap *B*, stiffened by an intermediate connecting strap *C*, with its ends bent up in Z-shape, as shown in the detail sketch. The purpose of this con-

of and behind the latter. By properly screwing these nuts the rear axle may be shifted forward or back, relatively, to the front axle and to the body, to which latter the engine is rigidly attached instead of being flexibly suspended. To accommodate the shifting of the rear axle, the spring hangers *D* are made with slip joints, so that the springs may be shifted backward or forward relatively to the body of the vehicle, and secured by tightening the nuts shown.

Double Piston Gas Engine.

No. 711,235. E. G. Shortt, Carthage, N. Y.

A gas engine with a double piston, the lower piston being larger than the upper,



LANE BROTHERS' AXLE-SPACING CHAIN ADJUSTMENT.

struction is to obtain a frame with the maximum stiffness in the center, where it is most needed. The first claim is as follows: "A frame for motor vehicles, including angle iron side members, tapering in depth or height from at or near the middle thereof toward the ends."

which is attached directly to it. On the down stroke an annular space is formed in the larger cylinder between it and the smaller piston, and at the bottom of the stroke the burnt gases are exhausted into this annular space, a quick exhaust being the object of the invention.

INDUSTRIAL

BROADENING SCOPE OF THE N. A. A. M.

SOME IMPORTANT RESOLUTIONS.

Executive Committee Calls Convention at Chicago Show to Approve Bills for Appropriation of \$20,000,000 for Transcontinental Highway and Resolves to Ask for National License Law.

Important business was transacted at the regular monthly meeting of the executive committee of the National Association of Automobile Manufacturers, held at the office of the association in New York on Wednesday, December 3. Two of these matters affect not only all manufacturers of automobiles, but all users of them and all users of the public wagon roads. These are covered in the following two resolutions, adopted at the meeting:

RESOLVED, That a convention be called for February 14 to 21, both inclusive, at the Coliseum, Chicago, to approve a bill which will be introduced during the present session of Congress to appropriate twenty million dollars (\$20,000,000) to be expended under the direction of the National Government for a national highway; this twenty million dollars to be distributed in the various states according to population, on application by any state or county—the state or county agreeing to furnish two thousand dollars (\$2,000) for each one thousand dollars (\$1,000) appropriated by the government.

RESOLVED, That the National Association of Automobile Manufacturers petition the Senate and House of Representatives to prepare, at the earliest practicable date, a bill providing for a national license to drivers of automobiles which will permit interstate commerce to be carried on without the inconvenience which would result from local licenses to automobile drivers.

RESOLVED, That Mr. J. Wesley Allison be appointed a committee of one to call upon the Senators and Congressmen and ask their action at the earliest possible date.

CHANCE FOR GOOD WORK

The action of the Manufacturers' Association in thus indorsing the project of a transcontinental highway and giving the support of its influence to a measure providing for national aid to the States in building it, following so closely upon the action of the directors of the American Automobile Association on November 17 in deciding to call upon all of the clubs to ask their representatives in Congress to vote for such a bill when it is introduced, indicates a large measure of interest among the automobile fraternity not only in this huge and spectacular plan for highway improvement, but also in the betterment of our wagon roads as a general proposition. This is a field in which the activity of the clubs can expend itself during the winter with promise of the accomplishment of a great deal of good.

Officers of the Manufacturers' Association, the Automobile Association and the Automobile Club of America do not seem

to think that the plans for such a road extending from the Atlantic seaboard to the Golden Gate is impracticable or impractical, as it is suggested that the work be carried on at four or five different points simultaneously, 100 or 200 miles of new road being built annually east and west from each point, until all of the sections are connected.

POINTS IN LICENSE PROBLEM.

Regarding the matter of a United States license law, Secretary Harry Unwin, of the Manufacturers' Association, said Monday that while there has been no general request for or sentiment in favor of a law requiring licenses on the part of automobile owners, there is a decided opposition to the enactment of local license laws, and it is expected that a general law will avert a movement in this direction and save motorists a vast deal of trouble, in addition to considerable expense. Without having looked into the legal point as to whether the general government would encroach upon the rights of individual States in passing such a measure, or whether the regulation and licensing of automobiles is properly a matter that can be taken up by the national government, all of which will be subject for discussion at the Chicago meetings, Mr. Unwin pointed out how the passage of license laws in the various States might, on the other hand, violate national law by interfering with interstate commerce. "As an example," he said, "suppose you had paid for a license in your own State and were out for a ride, and being near the border, wished to cross over and take luncheon in the adjoining State, you would have to buy a new license in that State or run the chance of being arrested. Plainly, that would restrain interstate commerce, as you would probably prefer to stay in your own State."

STANDARD FOR LUGS AND SPACING.

The matter of a standard for the number of lugs on tires and lug holes in rims and the spacing for them was settled by the adoption of the following resolution:

RESOLVED, That this Association adopts as its standard, the following number of lugs and spacing for same on single tube tires:

For rims 26 inches and 28 inches in diameter, 5 lugs, placed 25 degrees, 90 degrees and 180 degrees on each side of the valve.

For rims 30 inches, 32 inches, 34 inches, 36 inches and 38 inches in diameter, 8 lugs, placed 25 degrees on each side of the valve, then 40 degrees and 50 degrees, alternately.

TO STANDARDIZE LAMP BRACKETS.

The committee decided to also take up the matter of the standardization of lamp brackets, and the secretary was instructed to inquire fully into this matter.

A resolution was passed directing the president of the association to appoint "a committee of three to report on a plan for the examination of chauffeurs and the issuing of certificates to them by the National Association of Automobile Manufacturers."

The committee refused to indorse any one automobile paper for an official organ, as all of the publications are members of the association, but favored the idea of the publication of an automobile daily or dailies during the New York and Chicago shows.

The following concerns were elected to membership: Active, Apperson Brothers' Automobile Co., Kokomo, Ind.; Cadillac Automobile Co., Detroit; Associate, Dow Portable Electric Co., Boston; Ralph Temple & Austrian Co., Chicago; J. M. Quinby & Co., Newark, N. J.; Electric Storage Battery Co., Philadelphia.

BUFFALO CONCERNS ENJOINED FROM USING PORTER BATTERY.

Special Correspondence.

BUFFALO, Dec. 6.—Judge John R. Hazel, of the United States District Court, granted an injunction this week, restraining the Buffalo Automobile Station Co., Edward L. Brady, William Hamlin and Arthur R. Pennell from using the Porter storage battery in their automobiles. The judge suspended the injunction when the defendants filed a bond of \$10,000 to cover any damages that may be awarded in the action. This allows the defendants to continue buying, selling, renting and using automobiles in which the Porter battery is used.

The suits were brought by the Electric Storage Battery Co., which last June sued the Buffalo Electric Carriage Co. for an alleged infringement of its patent, and secured an injunction from Judge Hazel restraining the defendant from using the batteries. A similar suit was brought against Chicago people, but Judge Kohlsaat there denied the injunction, his ruling being directly opposed to that of Judge Hazel. Appeals were taken from both decisions and they are now pending before the Circuit Court of Appeals.

The defendants in the action heard by Judge Hazel last Tuesday claimed that a representative of the Electric Storage Battery Co. recently came to Buffalo and demanded that the Automobile Station Co. make a contract for all batteries to be used within one year from date. The claim is made by the defendant that the patent in question will expire on March 2, 1903, and that the owners thereof are trying to extend it beyond its legal length.

Exports from New York.

During the month of October, 1902, the exports of automobiles and parts of the same reached a valuation of \$122,624, as compared with \$55,735 in October, 1901. During the ten months ending with October, 1902, these exports amounted to \$970,610, against \$262,537 during the corresponding period ending October, 1901.

W. H. Brewer, of Raleigh, N. C., is having a building put up to be used for an automobile repair shop and factory.

NEWS REVIEW FROM WESTERN MANUFACTURING CENTER.

Special Correspondence.

CLEVELAND, Dec. 6.—The Cleveland Automobile Association has prepared plans for the automobile show in this city, and manufacturers are now receiving the prospectus, accompanied by an outline diagram of the floor space and all information in regard to the coming exhibition. Already several of the local manufacturers have begun to arrange for the show, and some of them will take perhaps three or four of the larger spaces, but a certain number of spaces will probably be reserved a reasonable time for others to make application. Many of the smaller Cleveland factories will make good displays, although it is not expected that they will want as much room as those who make several styles of machines.

There are a number of factors that will make this city an important point for an exhibition of this kind. Besides being the most important point in the country for the manufacture of all kinds of automobiles, it has many large retail establishments, and the warerooms and repositories now in course of construction will be interesting matters of investigation. The housing and sale of vehicles of this kind is still a new problem, and the plans here being worked out will be of value to those who are contemplating salesrooms and storehouses.

WINTON'S NEW CUP RACER.

Although the famous racing machine used by Alexander Winton has been dismantled, Mr. Winton, who has volunteered to represent the Automobile Club of America as one of the American team in the international Gordon Bennett cup race next year, is having a new machine constructed after plans of his own. A new experimental shop has just been completed near the factory where this work is being done, under the personal supervision of Mr. Winton. It is said that this building was erected especially for building this machine, so it may be judged what interest he is taking in the matter. He will sail for Europe with the new machine about May 1, and if it does not make faster time than the Winton "Pup," there will be considerable disappointment.

NEW STEARNS TOURING CARS.

Following the increase of the capital stock of the B. F. Stearns Co., it is stated that several well-known capitalists of Cleveland have become interested in it, and that the new directorate, which will soon be announced, will contain names that would be a credit to any concern.

The new touring car which will be built for the coming season has several important features not contained in the previous machines made by this company, and is said to be unusually comfortable. Most noticeable, perhaps, are the extraordi-

narily wide seats and their luxurious upholstery. To enable the builders to fit the car thus, the wheel-base has been increased to exactly eight feet. The front seat will accommodate three people with ease, while four can occupy the tonneau with comfort. The backs are high and made to conform to the shape of the body.

Power is furnished by a double-cylinder motor suspended horizontally in the rear. It will develop 24 horse power, and is of a type that admits easily of regulation and repair. Transmission is through sliding gears, so carefully made that a change can be made with little trouble or discomfort to the driver or passengers. On the highest gear the machine is expected to be able to make forty miles per hour, and it is claimed that on the lowest gear it will be able to climb any hill that other machines will mount. There are three speeds, both forward and reverse. The water circulating gauge, spark coil, switches and oil pump are placed on the front dash. Wheels of 34-inch diameter, of the artillery type, with twelve spokes and 4-inch detachable tires, will be fitted. Material is on hand for 100 of the machines and several have already been sold. A racing machine will also be made, but the company is not ready to make any announcement in regard to it.

BARDONS & OLIVER PLANT BURNED.

The machine plant of Bardons & Oliver, who manufacture a large line of turret lathes and machines used by automobile manufacturers, was totally destroyed by fire a few nights ago, together with a large trunk factory in the same building. The loss will be heavy, but it is stated that a new factory will be erected at once.

OHIO TRADE BREVITIES.

The Cleveland store of the Oldsmobile Co. is no longer a branch of the New York house, but hereafter will be operated independently, with R. M. Owen as manager. There probably will be no great change in policy, but the management will be in better shape to take care of its business here, which is growing rapidly.

The stockholders of the Sandusky Automobile Co. held a meeting a few days ago and elected a board of directors consisting of the following persons: Edward Cable, Myron Caswell, Jay F. Bennett, B. H. Ely, F. X. Frantz, E. S. Beardsley, Jacob Kuebler and J. J. Hinds. The company is preparing to complete its factory, which is now under construction.

A location on Huron Street has been secured by the Ohio Automobile Co., which will handle machines at retail. It is within a few steps of the retail house of the Winton people. F. McCowan is the active spirit in the company.

A company is being formed at Middletown for the manufacture of automobile motors. John McAdams, Henry Liebee, C. H. Clapp, George H. Shafer and two or three other Middletown men are interested in the venture.

WARRANT ISSUED FOR E. J. PENNINGTON, NOTORIOUS PROMOTER.

Special Correspondence.

MILWAUKEE, Dec. 6.—E. J. Pennington, of international and airship fame, is wanted by the police. His sample automobile which was exhibited at Cincinnati and Toledo, and some of his wearing apparel, tools, books and cases are under lock and key in the Hotel Racine, at Racine, Wis., from which place he disappeared suddenly a few days ago. A warrant was issued for his arrest at Racine last Wednesday upon complaint of the management of the St. Nicholas Hotel in Cincinnati. It is said that Mr. Pennington and his wife, formerly Miss Butterfield, of Milwaukee, have gone to Toledo, but efforts to locate him there have been futile.

Recently Mr. Pennington came from Cincinnati to Racine and a report was sent out that his patents and automobiles adapted for use in war had been purchased by the British Government and that Pennington had received \$5,000,000 cash for them.

A few days later announcement was made that Pennington had purchased the entire plant of the Racine Boat Mfg. Co., which would receive from him no less than \$300,000 in cash, and that he would manufacture automobiles on a large scale there. Last week Mr. Pennington was in Fond du Lac, Wis., and after only a few hours a report was sent out that he had completed arrangements for a \$200,000 automobile factory at that place. The Milwaukee newspapers, as well as all others throughout the State, gave much prominence to the story and the Fond du Lac paper never had so important a piece of news since the city was established.

Pennington and his wife were in Cincinnati several weeks and during that time lived in the finest suite at the St. Nicholas Hotel. The Racine police, who have the warrant for his arrest, have informed the Milwaukee authorities.

Pennington first sprang into national notoriety as a promotor of "fake" enterprises in Chicago in the early '90's through the endeavor to float a big company to manufacture airships after a small model which Pennington showed in the old Exposition Building on the lake front. He proposed to construct an immense factory at Mount Carmel, Ill., and sold much stock in the enterprise. Later he tried to float a company to make motor-bicycles, a full size model of which he exhibited at the Chicago bicycle show in the Lake Front Armory in 1894 or 1895. He soon after went to England, where his plans for motor-quadracycles for military purposes were carried to amazing lengths and made him as notorious there as on this side of the Atlantic. Pennington bobbed up in America again last year in connection with the Pennsylvania Steam Vehicle Co., of Carlisle, Pa., which tried to float stock on an impracticable

steam tractor called the Tractobile, to be attached to any ordinary carriage.

INVENTIVE AND INDUSTRIAL PROGRESS IN SYRACUSE.

Special Correspondence.

SYRACUSE, Dec. 6.—Notwithstanding Kentucky is by practice, heredity and tradition recognized as the horse State of the country, Ira S. Barnett, of Sutcliffe & Co., Louisville, has succeeded in introducing a large number of motor vehicles there. Nor has there been any clash between the motorists and the authorities, as the former have been careful not to frighten the high spirited animals. Mr. Barnett has closed a contract with the H. H. Franklin Mfg. Co. for the Kentucky agency for the Franklin air-cooled runabout. He will also represent the Winton and the Oldsmobile.

The Franklin company received notice recently of the allowance of twenty-five claims on its vehicle. A number of other patents are also pending, the invention of

mobiles, has elected the following officers: President and manager, J. S. Leggett; secretary and attorney, Charles W. Tooke; treasurer, William A. Wynkoop. The directors are: Forest G. Weeks, Charles W. Tooke, John S. Leggett and William A. Wynkoop, of Syracuse, and Edwin R. Redhead, of Fulton.

AMERICAN REPRODUCTION OF GERMAN DAIMLER CAR.

An exact reproduction of the 12 horse power Daimler machine, built by the Daimler Motoren Gesellschaft at Cannstatt, Germany, has been made by the Daimler Manufacturing Company, of Long Island City, New York, and will be manufactured for the American market. The accompanying illustration shows the American-built machine from a photo taken shortly after its completion. The mechanical details are reconstructed from German drawings, every part being as

same alloy. The frame is of channel iron braced on proper engineering principles with a view to strength and light weight. The springs are long, strong and flexible, adapted to give comfort at all speeds. The wheels are equipped with roller bearings and 4-inch Dunlap tires. The wheel base is 7 feet 4 inches, the gauge 4 feet 8 inches. One lever controls all of the four forward speeds and automatically locks each of the speeds as it is set. Another lever controls the reverse. A foot lever applies the cone clutch when the motor shaft is to be connected with the transmission gear and the same lever applies the brake on the gear shaft when the clutch is released. Another brake operated by the other foot acts on the sprocket shaft. A third brake, for emergencies, is of the expansion type and acts on the rear wheels. The gasoline tank is located in the rear of the vehicle; it is of heavy sheet copper and holds enough of the fluid for a run of 250 miles.

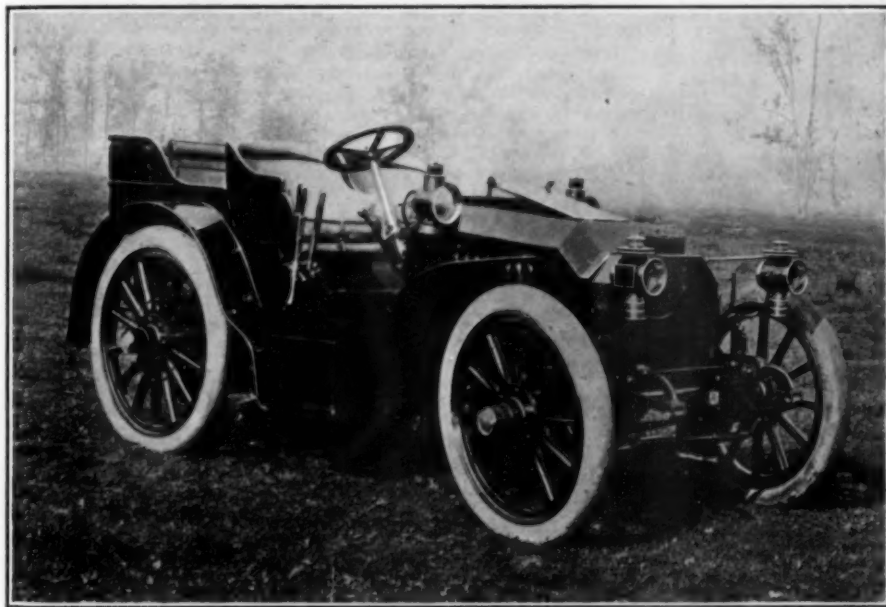
Fire in Wheeler Plant.

Damage to the extent of about \$15,000 was done in the plant of the Wheeler Mfg. Co., 10 to 16 Baltimore Ave., Detroit, on November 26 by a fire that started in the metal polishing room at about 5:30 A. M. from some unknown cause. Newspaper reports of the affair exaggerated the damage. The company will not suffer a delay of more than a few days and expects to continue doing business at the same location with increased facilities. The racing automobile owned by William C. Rand, secretary and treasurer of the company, which competed in the races at Grosse Point track, was badly damaged by the fire. The Wheeler Company makes rattan seats and steering handle grips for automobiles, in addition to bicycle saddles and grips.

Clean Run of Rambler.

In the commemoration run of 100 miles held by the Automobile Club of Great Britain on November 8 last from London to Maidenhead, the Rambler was the only American gasoline car which competed and earned a first-class certificate for a faultless, non-stop record. Of the 193 British, French and German cars which took part only thirty-four finished, many leaving the run on account of the rainy weather. The Rambler was driven by Walter C. Allen, of the firm of Davis, Allen & Co., British representatives of Thomas B. Jeffery & Co., of Kenosha, Wis., the makers, and it was the first appearance of this machine in English competition.

Mr. F. A. La Roche, representing the American Darracq Company, of New York, sailed for the Paris Automobile Show on the *Celtic* last Wednesday, and is empowered by his company to make arrangements for 1903 cars for shipment to this country. He will return early in January.



AMERICAN DAIMLER CAR, MADE IN BROOKLYN BY DAIMLER MFG. CO.

John Wilkinson. The principal feature is the air-cooled engine.

MAY MAKE NEW MOTOR.

Patents were received lately by Albert and Shirley F. Lewis, of 711 E. Fayette street, on a gasoline motor and a motor vehicle. The most important novel feature of the engine is a compression relief valve in the head of the cylinder which can be opened by means of a cam lever. This makes the starting of the motor a matter of only slight exertion. Several Syracuse and New York men are said to be interested in the inventions and to be contemplating the erection of a plant for the manufacture of both the motor and the vehicle.

LEGGETT COMPANY ELECTS OFFICERS.

The J. S. Leggett Mfg. Co., recently incorporated for the manufacture of auto-

nearly as possible an exact facsimile of the imported article. Until material may be compiled for a more complete description of this vehicle the following data supplied by the manufacturers will be found of interest:

The ignition is by hot tube and also by electric jump spark, the hot tube being mainly a stand-by for emergencies. The motor speed ranges from 400 revolutions to 900 revolutions and by means of the accelerator may be increased to 1,200. The radiator is of the multi-tubular Mercedes type by which not only the amount of cooling water to be carried is reduced to a minimum, but which also obviates frequent renewal of the supply by keeping the temperature well down. The four-cylinder motor rests on an aluminum base and is covered with a hood of the

St. Louis Cars in Boston.

Several new styles of cars will be built during 1903 by the St. Louis Motor Carriage Company, whose cars have become popular not only in the Mississippi Valley, but also in the vicinity of Boston. The Semi-Racer has a sixteen-horse power engine located in front, sliding train of gears, three speeds forward and reverse, individual carbureter for each cylinder. It was designed by G. Preston Dorris, the vice-president of the company—who is

can ride in comfort, and no additional seat is provided, the intention being not to overload the vehicle. Chain drive is employed, and the machinery is readily accessible. The lines of the vehicle are smart and it is a good example of the American auto runabout.

New Enterprises.

William K. Bassford, Jr.; Louis Heck and Charles Isbills have incorporated the Gearless Motor Vehicle Company, with a

Harry H. Piting and Cleveland V. Childs are the organizers. The capital stock is fixed at \$100,000, with \$1,000 paid in.

A group of Mexican and American capitalists, residents of Mexico City, are reported to have formed a \$200,000 automobile manufacturing company.

I. L. Fairbanks, president, and J. Berry, treasurer, are the officers of the National Automobile Company, organized at Augusta, Me., for making and dealing in motor cars.

John S. Cox, A. Chaney, Spencer F. Ball, Charles Marshall and A. H. Donham have formed the Chaney Automobile Company, of Terre Haute, Ind., to buy and sell automobiles.

The Chaney Automobile Transfer and Storage Co. has recently been formed in Terre Haute, Ind., to deal in bicycles and automobiles, and to do a general repair business. John S. Cox is president and A. Chaney vice-president and manager.



THREE BOSTON MODELS OF ST. LOUIS MOTOR CARRIAGES.

shown at the wheel in the accompanying illustration. The Tonneau Touring Car differs from the Semi-Racer only in carriage work. The St. Louis Victoria has a two-cylinder, vertical engine, 5 1-4-inch bore and 6-inch stroke, giving 16 horse power. The variable gear arrangement is the same as in the other styles. The wheel base is 8 feet. It seats two passengers, while the operator drives from the rumble seat. Four-inch detachable tires are fitted to the wood wheels. The eastern agency is now with Bates Bros., Inc., 145 Columbus avenue, Boston.

Sandusky Gasoline Runabout.

A neat, light, runabout, built for American roads, is the description given to the Sandusky automobile by the builders, and, judging by the accompanying photograph, the description is not inappropriate. The Sandusky weighs 600 pounds, and is fitted with a horizontal single cylinder gasoline motor of 4 horse power. It has two speeds forward, and one speed back, and is capable of a maximum speed of 25 miles an hour. The body is carried on an angle iron frame, which is attached to side longitudinal springs. On the seat two persons

capital of \$125,000, under the laws of New Jersey.

Papers of incorporation have been issued by the Secretary of State of New Jersey to the Orange Automobile Company, with offices in East Orange. John M. Schmidt,

mobile and Motor Company, of Utica, N. Y., now in the hands of receiver, that the company can be made to pay by the infusion of more capital. It had over forty orders on its books when the doors were closed.



SANDUSKY 4 HORSE-POWER LIGHT GASOLINE RUNABOUT.

INFORMATION FOR BUYERS.

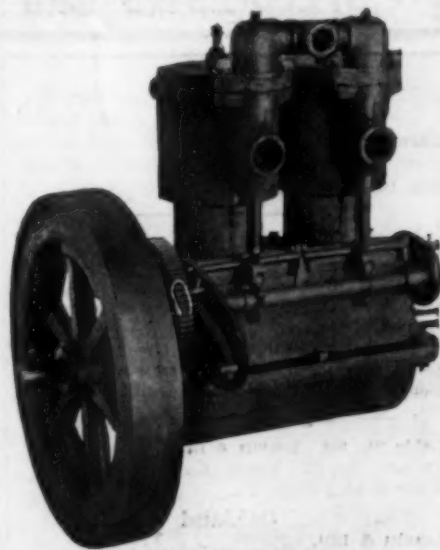
TWO NEW SPARK PLUGS.—A. W. King, of Maywood, N. J., is now placing upon the market two new designs in spark plugs, the Walter and the Non-Stop. In the first one security against short-circuiting is obtained by unusually large areas of sparking surface; in the other the areas are not quite so large, but on the other hand a method is introduced for cleaning the terminals by the mere opening of a vent cock. The Walter plug is shown to the right in the accompanying illustration. As usual the central terminal is insulated by porcelain from the holder which serves as the opposed terminal for bridging the electric current. The central terminal consists of a cup-shaped piece of metal measuring nearly two inches in circumference and is termed a "mushroom" terminal by its maker. Directly opposite to the sharp edges of the mushroom is located the circular edge of the other terminal forming part of the holder which screws into the cylinder head of the motor. Obviously the chances for having all of these large surfaces coated with soot—or the hard carbonaceous matter resulting when alternate layers of soot and oil are baked together—are much reduced, as compared with the wire sparking points ordinarily used. Short-circuiting by coating of the insulating material, which is the commonest form of short-circuiting, is obviated by the mushroom shape of the terminal which causes deposits to be made in it rather than on the porcelain. The reference letters in the drawing are explained as follows:

A, annular terminal, integral with holder D; B, mushroom head of inner terminal C; C,

having been found most suitable with large sparking surfaces. Should this distance be bridged by deposits, the means for cleaning the terminals is at hand, for a vent cock is screwed into the chamber, as shown most clearly in the third figure of the drawing. By opening this cock at the end of the compression stroke the cylinder charge may be blown out through the spark-gap to the exclusion of any other passage, tearing loose and ejecting through the opening of the vent any substance which may have found lodgment between the terminals. The same vent should be used as a compression relief cock when starting the machine, thereby always securing clean terminals after a stop. When it is desired to remove the central terminal this can readily be done while leaving the chamber with the vent cock on the engine. It has been the object of the designer by this construction to provide a spark plug which, under no circumstances that could arise in the ordinary use of automobiles, will make it necessary to unscrew the plug for mere purposes of inspection or cleaning, the simple expedient of blowing off the cylinder—preferably with the electric current disconnected—giving all needed assurance that if there is any trouble it is not with the terminals.

HOFFMAN ENGINE.—The Hoffman gasoline automobile motor is a compact, powerful, well-built engine. It operates on the well-known four-cycle principle. In the upright types the bore of each cylinder is 4 inches and the stroke 5 inches; the piston is made a drive fit and is

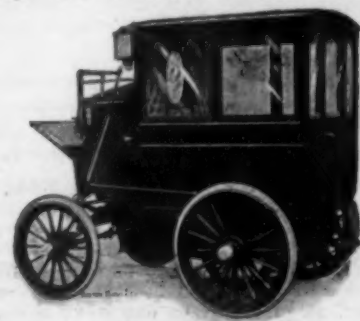
ment. Further information, prices, etc., can be had by writing to H. L. Hoffman Motor Company 30 West Randolph Street, Chicago, Ill.



HOFFMAN MOTOR.

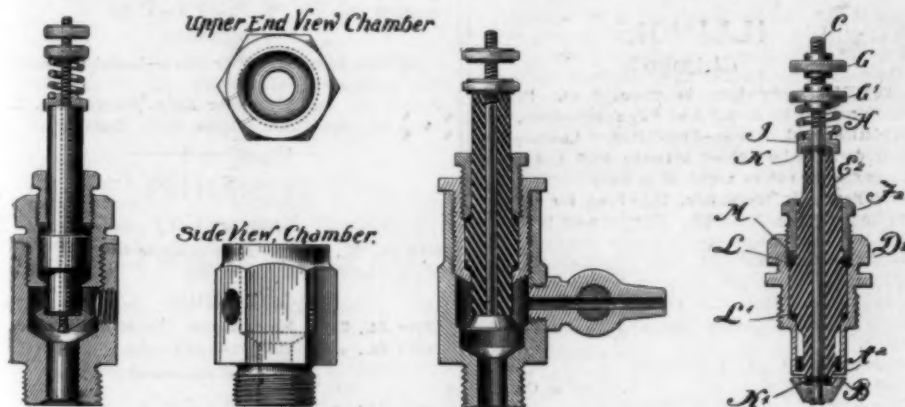
MOBILES AT \$550.—The Mobile Company of America has systematized its manufacture of the Mobile runabout to such an extent that it can now afford to reduce the price and meet the popular demand for a vehicle costing in the neighborhood of \$500. The price decided upon is \$550, and at this figure the company intends to furnish a car in some respects superior to the \$750 runabout of this year and in no respect of lower grade. The equipment includes steam air pump, cylinder oil pump, low-water alarm and double-acting brake. The material and workmanship, the company asserts, is equal to the standard of the larger models of Mobiles costing \$2,000. A very essential point is this, that "not including tires, paint and upholstery there are less than thirty dollars' worth of parts, all told, subject to replacement for heavy wear."

PRIVATE OPERA BUS.—The Electric Vehicle Co., of Hartford, Conn., has placed on the market a cab designed as a private theater bus where more than the ordinary seating capacity is required. It will carry six persons and is furnished with electric lights, mirror, card pockets, hat cords, etc. The windows are of heavy, beveled glass, and have full openings when lowered. The motor is of three speed, forward and backward, with self-oiling bearings. The battery will run the cab thirty-five miles on one charge. The wheels are fitted with 3 1-2-inch solid tires. A foot-operated brake and an emergency brake have been placed conveniently. The manufacturers assert that this



ELECTRIC VEHICLE CO. BUS.

opera bus, in finish, equipment and general appearance, is the best ever turned out of the factory.



A. W. KING'S NEW SPARK PLUGS.

inner terminal; D, holder for insulator E; E, porcelain insulator; F, gland securing insulator within holder; GG, thumb nuts for attaching electric wire; H, helical spring, compensating for difference in elongation by heating of insulator E and terminal C; I, end-cap, centering spring H and holding within its lower cavity an asbestos washer, packing terminal C at its issue from insulator E; K, asbestos washer at upper end of insulator E; K', asbestos washer at lower end of insulator E, packing between mushroom head B and insulator E; L, asbestos packing between gland F and shoulder on insulator E; L', asbestos packing between bottom of holder and insulator; M, metal washer serving as bearing for gland F.

The maker considers it an advantage that the large terminals in this plug will retain some heat, as this will cause oil, which might reach the terminals, to vaporize rapidly and be consumed by the next combustion in the motor.

The Non-Stop plug was designed by E. F. Brown and is shown in the first three figures of the illustration. The sharp edges of the button-shaped inner terminal are located at an equal distance of 3-64-inch all around from the interior wall of a surrounding chamber which constitutes the ground terminal, this distance

worn down by belt through service; it is fitted with three eccentric snap rings with square joints. The valves are large. The cylinder is water jacketed and is cast separate from the base, the base itself is made in halves. The suction valve casing is cast separate and the whole suction valve can be removed with casing by simply removing two nuts. The suction valve spring and stem and bearing are encased and protected from dust. The exhaust valve is located directly beneath the suction valve and the stem seat is a phosphor bronze bearing. The valve stems are adjustable, allowing for wear that may occur on the cam. The exhaust valve is operated by two out spur gears. The crank shaft is a steel forging and in one piece from end to end. Connecting rods are phosphor bronze, adjustable. Flywheel is 18 inches in diameter. Jump spark system of ignition is used, and the commutator, with which all engines are equipped, is dustproof and adjustable. All speeds are possible from two to fifteen hundred revolutions per minute, the speed is controlled by shifting spark and throttling the mixture either independently or together. Lubrication is by means of splash in crank case and sight feed on the cylinder. All engines are balanced, and in perfect working order before ship-

STORAGE, REPAIR AND SUPPLY STATIONS SPEED LAWS AND OTHER REGULATIONS

ARIZONA

Prescott

Brown Bros.

Tucson

Jas. B. Saeger.

CALIFORNIA

SPEED—By local ordinances limited 4 m. to 12 m. Penalties, not exceeding \$500, or imprisonment not exceeding 6 mos. Lamps and Bells—Required by most ordinances. License—In Napa, \$10 a year. San Francisco forbids storage of more than 5 gallons of gasoline within buildings.

San Francisco

Lakin St., 909. Leavitt & Bill.
Tremont St., 97. Manufacturers Co.
White Sewing Mach. Co.

Oakland

Leavitt & Bill.
Mobile Co., of America.

San Jose

Osen & Hunt.
Millard Bros.

Sacramento

Jim Banta.
Viking Cycle Co.

Los Angeles

Broadway, So., 108. Locomobile Co., of America.
Main St., 439. Crippen & Church.

San Bernardino

Parker Iron Works.
Williams Cyclery.

Riverside

Magnolia Auto. Co.
Stoner Machine Shop.

Redlands

Redlands Iron Works.

Pasadena

Pasadena Machine Shop.
Hodge Bros.

COLORADO

Denver

California St., 1455. Geo. E. Hannan.
Felker Automobile Co.

Colorado Springs

W. O. Anthony.
F. F. Burnstead.

Pueblo

C. W. Fowler.
Pueblo Novelty Works.

CONNECTICUT

SPEED—Outside city limits, 15 m.; inside, 12 m.; reduced at crossings; penalty for violation, not more than \$200. Horns or Gongs—Not required by letter of law. Lamps—Required on all rubber-tired vehicles; must be lighted from 1 hour after sunset to 1 hour before sunrise; penalty, \$5. If lights go out, operator "may proceed at 6 m. and give audible signal as often as 500 ft. are passed over."

Hartford

Aliyn St., 304. S. A. Miner.
Wells St., 43. Hartford Automobile Station.

New Haven

Goffe St., 106. H. C. Holcomb.
State St., 532. Reichert's Auto. Station.

DIST. OF COLUMBIA Washington

SPEED—Outside city limits, 15 m.; off car-line streets, 12 m.; on intersecting car-line streets, 6 m. License—Required; fee, \$3; penalty, for operating steam vehicles without permit, \$1 to \$40.

Conn. Ave., N. W., 1124. National Capital Auto. Co.

FLORIDA Jacksonville

F. E. Gilbert.

GEORGIA Atlanta

Forsythe St., So., 55. C. H. Johnson.

ILLINOIS Chicago

SPEED—Everywhere in town, 8 m. Bells—Required, to be sounded at street crossings, etc. Whistles and Horns—Prohibited. Lamps—Required; must be lighted between dusk and dawn. License—Operators required to have license; fee, first year, \$3; thereafter, \$1. Fine for driving without license, \$5 to \$25. Numbers or Initials—Not required. Brakes—Two sets required, one independent of driving gear. Special—No machinery may be left running when vehicle is standing in street with no one in charge. In other cities and towns, various local regulations apply.

Calhoun Pl., 4. A. J. Millman.
Cottage Grove Ave., 5311. C. A. Coey & Co.
Plymouth Pl., 12. S. S. Williams.
State St., N., 285. Chicago Auto. Repository Co.
Superior St., E., 385. North Division Auto. Co.
Van Buren and Oakley Blvd. Hagmann & Hammerly.

INDIANA

SPEED—No state law. Various local regulations 8 to 10 m. in city limits. Fine for violation, \$1 to \$50.

Terre Haute

S. Seventh St., 25. A. Chaney & Bro.

IOWA

SPEED—No state law. Davenport City Ordinance limits speed to 8 m. Bell and Lamp—Required.

Cedar Rapids

Cedar Rapids Supply Co. J. C. Pickering.

LOUISIANA New Orleans

Baronne St., 400. Automobile Co., Ltd.
Baronne St., 408. Abbott Automobile Co.

MASSACHUSETTS

SPEED—State law provides outside city limits, fire district or thickly settled part of town, 15 m.; inside such limits, 10 m.; approaching horses, reduce speed if animal shows fright and stop on signal of driver; reduce at crossings. Penalty—Fine not exceeding \$200, or imprisonment not exceeding 10 days, or both. Ordinances—Various local regulations in cities and towns.

Boston

SPEED—In city streets, 10 m.; in parks, 8 m.; outside city, 15 m. Lamps—Three required. Parks—Permit required from Park Department. Columbus Ave., 43 and 45. G. T. Gould.
Columbus Ave., 147-153. A. J. Coburn & Co.
Clarendon and Stanhope Sts. Back Bay Hydro-Carbon Repair Co.

Stanhope St., 66-68. Tremont Auto. Headqts.
Tremont and Berkley Sts. Boston Salesrooms.

Cambridge

Mass Ave., 424. Crest Mfg. Co.
Palmer St., 8-10. Harvard Auto. Co.

Salem

Dodge & Lafayette Sts. Zina Goodell Mfg.

Springfield

SPEED—State law applies. Reduce at street intersections. Lamps—Required 1 hour after sunset; not enforced. Alarm—Required to be sounded as necessary. Parks—Permit required for Forest Park; furnished free; rules accompany permit. No registration.

Taunton

Post Office Sq., 4-5. Robertson Auto. Station.

Waltham

Newton St., 136. Waltham Auto. Co.

Worcester

SPEED—10 m. Gong or Horn—Required. State law applies.
Foster St., 43. Worcester Auto. Station, No. 1.
Main St., 671-673. Robinson Auto. Station.

MISSOURI Kansas City

11th St., E., 320. Day Automobile Co.
Main St., 708. Wittman Co.

St. Louis

Olive St., 3935. Miss. Valley Transportation Co.
Olive St., 4259. Missouri Auto. Co.

NEBRASKA Omaha

Olds Gas Engine Works.

NEW JERSEY

SPEED—Various city, town and county ordinances, limiting to 6 to 12 m.; penalty, \$5 to \$200. Lamps—Required in some towns, together with alarm signals. Initials—Required by most of the ordinances.

Atlantic City

Atlantic Ave., 1003. J. C. W. Parsons.
Maryland Ave., S., 12. H. W. Cochran.

Newark

Mechanic St., 27. W. B. Dodge.

Paterson

Broadway, 405. F. W. Stockbridge.

NEW YORK

COCKS LAW—Speed—Outside corporate limits, 20 m.; on bridges, 4 m.; inside corporate limits, 8 m., except where higher speed is permitted by local ordinances; penalty, \$50 or imprisonment not exceeding 6 mos., or both. Highway Law (Doughty)—Speed—Outside built-

up parts of towns and villages, 15 m.; in built-up parts, 8 m. Registration—Owner must secure certificate within ten days after getting machine; fee, \$1. Initials—3 in. high, 1/2 in. wide on back of each vehicle. Lamps—2 required, white in front, red in rear; must be lighted 1 hour after sunset, 1 hour before sunrise. Horn or bell required. Brakes—Good and efficient; penalty not exceeding \$25. Local Ordinances—The state law prohibits local town and park boards from excluding automobiles from open highways; from placing lower speed limits than 8 m., and from requiring license or permit except from owners of public vehicles.

New York City

7th Ave., 515. Smith & Mabley.
38th St., 136. Standard Auto Co.
38th St., W., 138. Oldsmobile Co.
38th St., W., 141. Banker Bros. Co.
43d St., W., 38. A. G. Spalding & Bros.
43d St., W., 50. Banker Bros. Co.
44th St., W., 307. Long Acre Auto. Depot.
44th St. and 5th Ave. Westchester Auto. Co.
50th St., W., 239. Alexander Fisher.
51st St., W., 143. Knickerbocker Auto. Station.
57th St., E., 140. John Wanamaker.
57th St., E., 154. Metropolitan Motor Car Co.
58th St., E., 33-39. Barry & Hayes.
58th St., E., 150-152. Winton Motor Carriage Co.
59th St., W., 306. A. Elliott Ranney.
60th St., W., 10. Webster Auto. Co.
60th St., W., 33. American Storage Co.
66th St., W., 57. St. Nicholas Auto. Depot.
80th St., W., 250. Pa-delford & Bell.
86th St., E., 205. Yorkville Auto. Station.
89th St., W., 202. West End Storage Co.
98th St. and 5th Ave. E. R. Fisher.
100th St., cor. Broadway. Homan & Schulz.
120th St., E., 175. Chas. Strathman.
127th St., W., 152. West End Auto. Exchange.
127th St., W., 153. Harlem Auto. Co.
Broadway, 1654. Central Auto Co.
Jerome Ave., 1918. Hoffman & Setzer.

Brooklyn

Bedford Ave., 712. Lincoln C. Cocheu.
Bedford Ave., 752. J. W. Mears.
Bedford Ave., 1148. Arthur R. Townsend.
Clinton St., 19. Maltby Mfg. Co.
Flatbush Ave., 342-44, near Eighth. A. G. Southworth.
Flatbush Ave., 473. Alex. Schwalbach.
Fulton St., 1239. Brooklyn Auto. Co.
Fulton St., 1241. Chas. W. Spurr, Jr.
Schermerhorn St., 58. Patterson & Shaw.

Albany

Central Ave., 97. Auto. Storage & Trading Co.
Pearl St., N., 167. Albany Auto. Works.
Sherman St., 255. C. F. Weeber Mfg. Wks.

Amsterdam

Division St., 8. Gode & Brown.

Buffalo

SPEED—6 m. on built-up streets, 15 m. outside; rounding corners, 5 m. Lamps—All hours after sunset. State law applies in other regulations.
Broadway, 58-60. D. C. McCann.
Main St., 873-875. W. C. Jaynes Auto. Co.

WOOD MUD GUARDS.—While metal or metal and leather is the material most commonly employed for the mud fenders of automobiles there are about a dozen manufacturers in this country who prefer wooden guards in point of appearance and durability, entirely apart from their lower price, and these are now made in all styles, sizes and shapes, including the "plow share twist" variety generally used for the steering wheels. The American Veneer Company, 449 Pacific Avenue, Jersey City, N. J., has turned its attention to this article and has developed a laminated guard which does not split, warp, shrink or crack. It is formed of

Rochester
Exchange St., 74. C. J. Connolly.
South Ave., 150. Rochester Auto. Co.

Syracuse

SPEED, ETC.—See state law. No local legislation.
Onondaga St., W., 110. Hoffman & Weaver.
Warren St., So., 346. Syracuse Auto. Co.

Troy

Fulton St., 339. James Lucey.

Utica

Oneida Square. Miller-Mundy Motor Carriage Co.

OHIO

SPEED—Various ordinances in cities, towns and villages, 5 m. to 15 m.; penalty, \$1 to \$100. Lamps and Bells—Required by most ordinances. Registration—No state law.

Cleveland

SPEED—Within 1/4-mile from east and west ends of Superior Street viaduct, 7 m.; outside such radius, 15 m. Must stop upon signal from horse driver. License—Required; fee, \$1. Numbers—Registered numbers must be attached at rear and kept clean. Lamps—One on each side must be kept lighted during darkness. Bell or Horn—Required, and must be sounded when there is danger of accident. Penalty—For violation of any section, fine not exceeding \$50.
Prospect St., 146. The Cleveland Automobile & Supply Co.

Columbus

SPEED—Off of business streets, 14 m.; on business streets, 8 m. Penalty—Fine from \$5 to \$50 or 30 days' imprisonment. Bells or Horns—One or other required to be sounded when necessary. Lamps—Required after dark. Penalty—Fine not exceeding \$50.

Toledo

SPEED—Inside city limits, 10 m.

Cincinnati

SPEED—In streets and parks, 8 m. Horns or Gongs—Must be sounded 100 ft. before street crossings. Lamps—Must be lighted between sunset and sunrise. Brakes—Efficient brakes required. License—None required. Initials—None required. Tolls—Bridge toll, 10 cents. Special—Two vehicles must not travel abreast.
Main St., 640. Special Motor Vehicle Co.
Race St., 807-809. Cincinnati Auto. Co.

PENNSYLVANIA

SPEED—Various ordinances limit it 6 m. to 10 m. Penalty—\$10 to \$100. Lamps and Bells—Required by a few ordinances.

Philadelphia

Broad St., N., 133. Quaker City Auto. Co.
Broad St., N., 246. Winton Motor Carriage Co.
Broad St., N., 250. Pennsylvania Elec. Vehicle Co.
Broad St., N., 304. Broad St. Auto. Station.
23d and Walnut Sts. John Wanamaker.

three layers of whitewood, each 1-8 inch thick, glued together, and the grain of the middle layer running crosswise and at right angles with the grain of the outside layers.

OIL HOLE COVERS.—The Bay State Stamping Co., of Worcester, Mass., has begun the manufacture of a new cover for automobile oil holes. It is made with screw-threaded top with packing for an oil-tight cover and without thread for common bearings. It is made from sheet steel and is light and durable. It is slightly flexible so it may be easily adjusted. The manufacturer has striven to make a cover

Lancaster

Queen St., N. 219. S. G. Roth.

Pittsburg

SPEED—6 m. to 10 m. Penalty—\$25 to \$100. Tax—Single-seated vehicle, \$6; others, \$10.
Center Ave., 5909. J. P. Oden.

York

SPEED—In city limits, 8 m. Lamps—Must display one or more lights.
George St., N., 14. J. P. Oden.
Market and Beaver Sts. J. H. Snyder.

RHODE ISLAND

SPEED—Law provides that any person driving faster than a common traveling pace in any of the streets of Newport or Providence, or in the compact part of any town or village, or in any road leading from Pawtucket to compact part of Providence be fined from \$5 to \$30, or imprisoned for 10 days. For racing on roads, or streets, \$10 or imprisonment for 10 days. Bells and Horns—One or other required, but must not be used excessively. Muffler—Required at all times on public highways. Initials—In black letters 2 in. high.

Providence

Opposite Union Station. H. G. Martin & Co.

TEXAS

Houston

Main St., 719. Houston Cycle Works.
Texas Ave., 903. Clark & Hawkins.

El Paso

P. L. Abel Cycle Co.
El Paso Cycle Co.

Dallas

D. W. McElroy.
Texas I. & M. Co.

Galveston

Market St., 2120. E. H. Labadie.
Tremont St., 712. J. Christensen & Co.

San Antonio

Commerce St., W., 218. Roach & Barnes Co.
Navarro St., 809. Chas. J. Chabot.

UTAH

Salt Lake City

Main St., So., 33. O. R. Meridith.
2d So. St., W., 62. Wilkes Cycle Co.

WISCONSIN

SPEED—Limited by various ordinances 4 m. to 10 m.; penalties, \$1 to \$50.

Milwaukee

Broadway, 501. Bates-Odenbrett Auto. Co.

that may be taken off with one hand, and that will not spill the oil.

LANE AUTOS.—The Lane Motor Vehicle Co., Poughkeepsie, N. Y., has been singularly fortunate in the contests where its machines were entered. These automobiles received the highest honors in the New York-Rochester contest, September, 1901; the Long Island contest, April, 1902, and that of the Automobile Club of America held in May, 1902. In the more recent reliability run between New York and Boston, a Lane steamer of nine horse power, weighing 1,790 pounds, qualified for the President's cup. Another Lane steamer of nine horse power, 100 pounds lighter, received a first-class certificate.

Information for Buyers.

NEW DEALERS IN BOSTON.—Bates Brothers (Inc.), have just opened a new automobile salesroom, repair and storage station at 145 Columbus Avenue, Boston. They are the eastern representatives for the St. Louis Motor Carriage Co.'s gasoline cars, and the E. R. Thomas "Buffalo Cars." The company will also handle a leading steamer for 1903. They are the eastern representatives, and have in stock a full line of Dyke's automobile parts and supplies. The salesroom is entirely separate from the repair department, and measures 120 x 50 feet, which affords ample space for the display and inspection of machines. The repair department occupies the entire floor of the basement, and is equipped with the latest improved machinery adapted to automobile repair work. In another column will be found illustrations and partial descriptions of the St. Louis vehicles handled by this new firm.

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AN AUTO

with a metal dash isn't all that it ought to be. It's an auto that is sooner or later—usually sooner, bound to cause trouble. For there isn't a metal dash on the face of this earth that won't crack and peel and rattle and jangle. It's "the nature of the beast."

Metal dashes were discarded as failures by all carriage manufacturers long ago, and

McKINNON DASHES

adopted in their stead.

The success that McKINNON DASHES have achieved among carriage manufacturers being repeated among automobile makers.

The more experience more auto makers have with metal dashes, the more more of them use McKINNON DASHES.

McKinnon Dash Co.

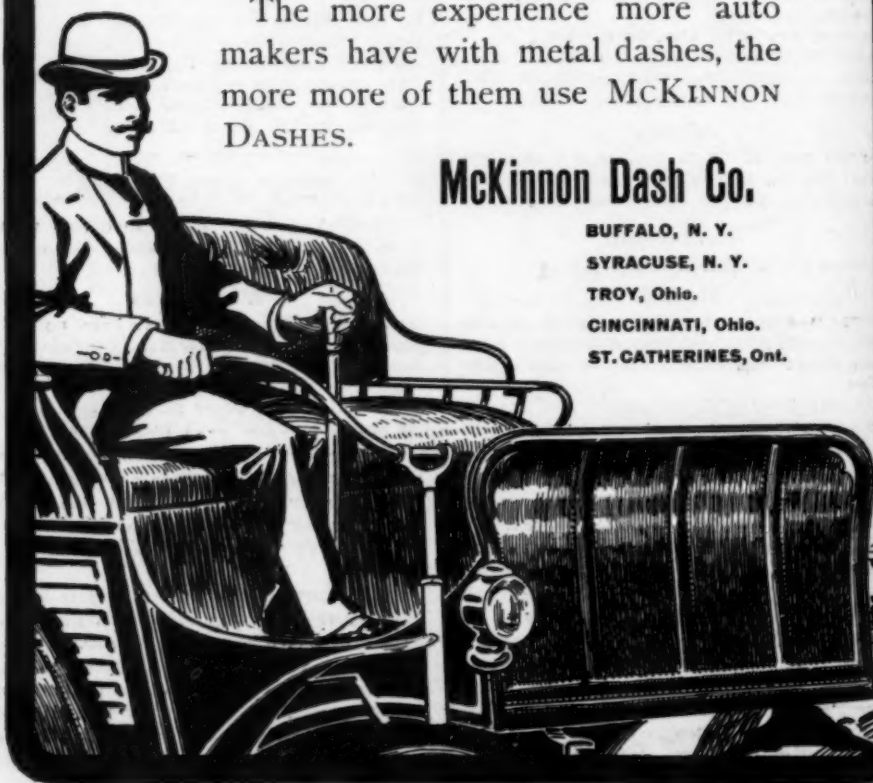
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Special Notices

Advertisements of second hand vehicles or parts for sale, or for Positions Wanted, inserted under this heading at 10c per line of about six words. Remittance must accompany copy.

BARGAINS—Locomobile, Style 3, with top; Locomobile, Style 2; Locomobile, style 2, with dos-a-dos seat; Steam Dos-a-dos, new; Steam Dos-a-dos, second-hand; Toledo Steam Model A, new; Toledo Dos-a-dos, steam touring car, French style. Write for particulars. Kline Automobile Co., Harrisburg, Pa. 20

BRIGHT young man, eighteen, good education, wants position with Automobile concern; references. "E. V." care Automobile and Motor Review. 13

FOR SALE—Motor tonneau, drop front, \$80. A. B. Prince, Exeter, N. H. 13

FOR SALE—Trimoto Three Wheeler, nearly new, cheap. For particulars address Chester B. Smith, Harrisburg, Pa. 20

FOR SALE—Waverley Electric Runabout, complete, less batteries, leather upholstered, sacrifice at \$175.00. C. LeJeal, Erie, Pa. 13

FOR SALE—Columbia mark 8, lot 5, Gasoline Runabout, \$500. Winton Touring Car, \$1,500. Both in first-class running order. Box 244 Hazleton, Pa. 13

FOR SALE—Mitchell 1902 motor cycle 2 h.-p. engine, powerful and speedy, bargain, \$80. B. Nunamaker, "The Manhattan" Cleveland, Ohio. 13

FOR SALE—Bargains in Second-hand Automobiles. Write for description and prices to C. A. Coey & Co., 5311 Cottage Grove Avenue, Chicago. 13

FOR SALE—A new Marsh motor cycle at a bargain for cash. If you are thinking of riding a motor cycle it will pay you to investigate. Address A. L. Mixer, Paulison Ave., Passaic, N. J.

FOR SALE—Fournier-Searchmont Tonneau Car, Model 1902, good as new, run only four months, too large and fast for physician to use for making calls. Address Dr. J. F. Shafer, 422 Penn Ave., Pittsburgh, Pa. 13

FOR SALE—Complete Running Gear with wood wheels, 3x28 Diamond tires, roller bearings; 6-½ h. p. vertical 4 cylinder gasoline motor and accessories; Copper water tank with air tubes; Upton transmission; Stanhope body painted one coat; All new and best material. Price, \$500. "G" 303 Commonwealth Bldg., Scranton, Pa. 13

FOR SALE—Winton Touring Car, like new, \$1,800. Locomobile, \$275. Fine Steamer, with boiler in front, horizontal engines, steam air and water pumps, wheel steer, wood wheels, new Dunlop tires, \$800. Kensington Steam Runabout, new, \$450. Toledo Steam, like new, \$600. Gasmobile, with top and rumble, \$650. De Dion Motorette, with reversible front seat, 5 h. p. \$900. 3½ h. p. Motorette, \$700. 3½ h. p. De Dion Motor, with accessories, \$125. 4 h. p. Aultman Kerosene, \$125. Orient Motor Bike, \$180. Thomas 2 h. p. \$135. Automobile Storage & Trading Co. (Inc.), Albany, N. Y. 13

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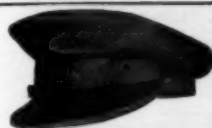
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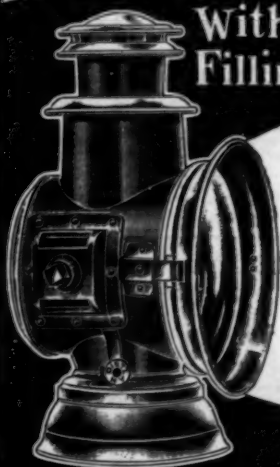
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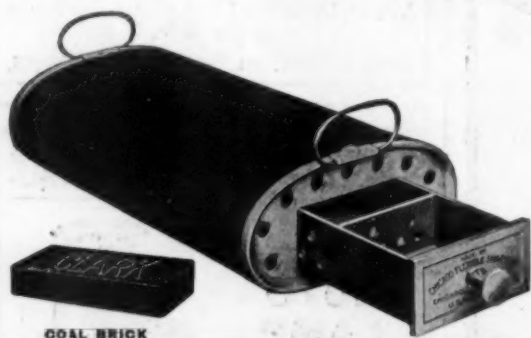
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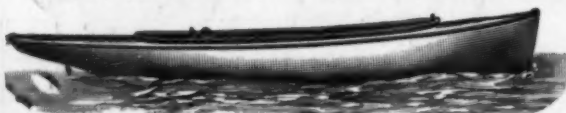
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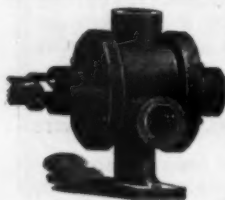
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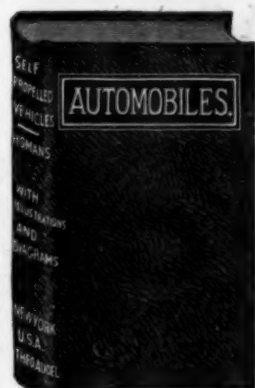
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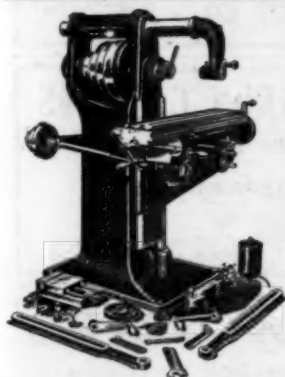
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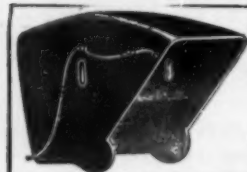
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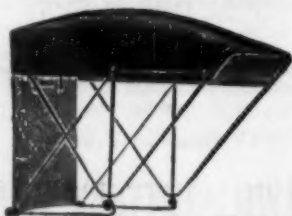
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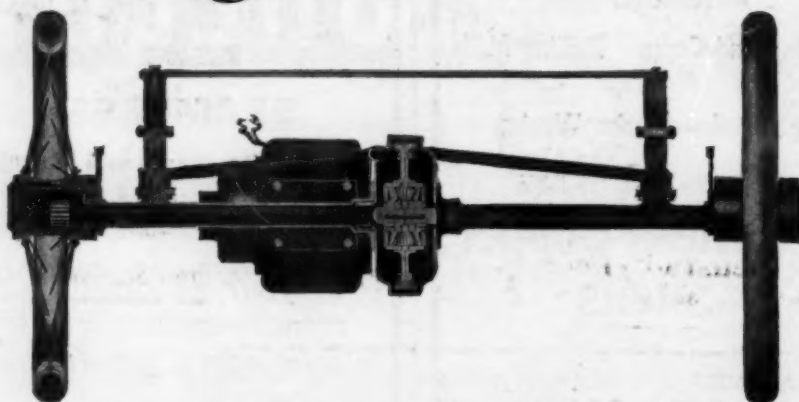
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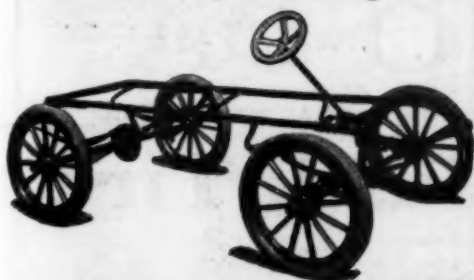
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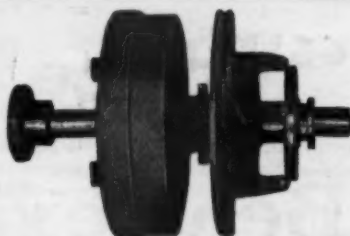
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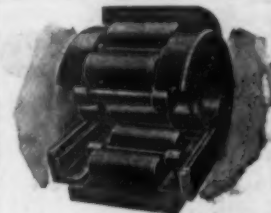


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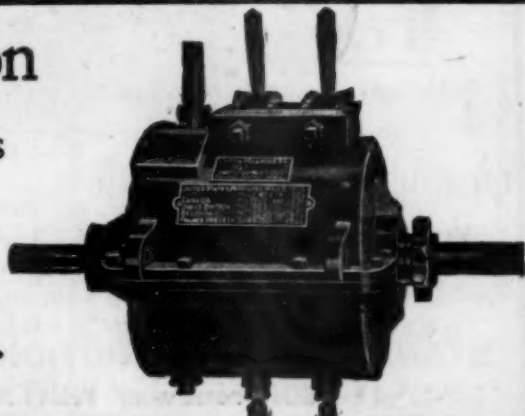
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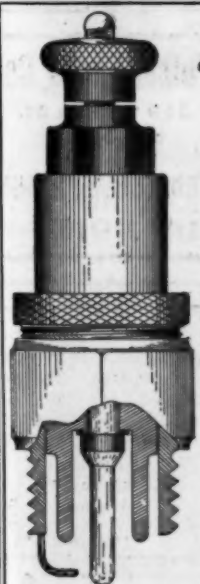
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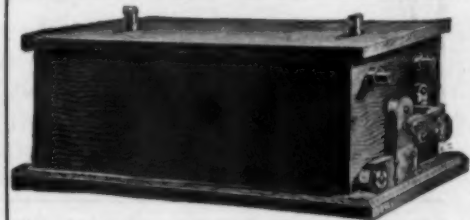
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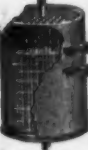


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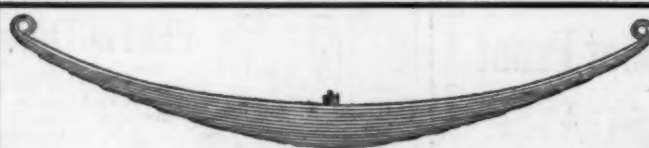
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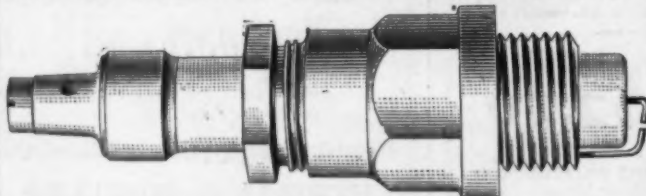


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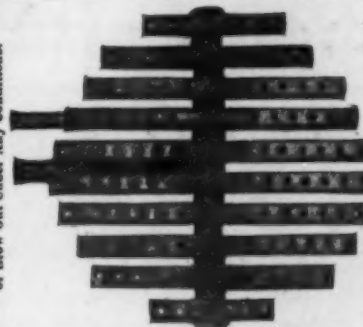


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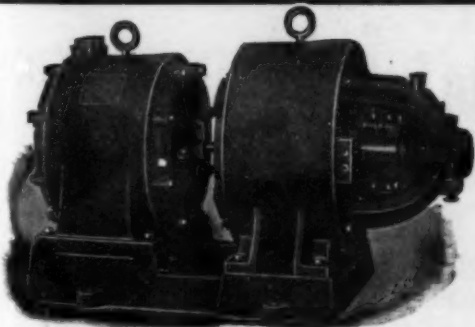
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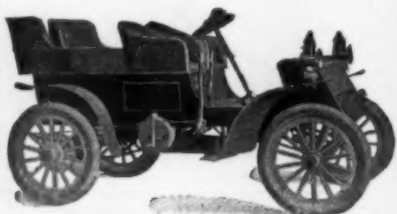
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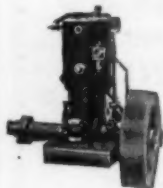
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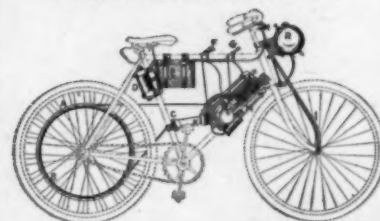
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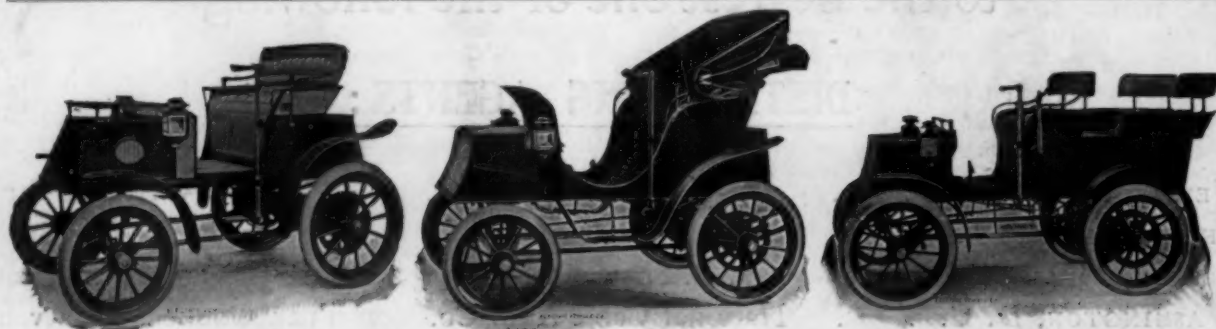
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